

## EVALUATION OF THE 3<sup>RD</sup> PILLAR PENSION FUNDS IN LITHUANIA

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**Abstract.** The article emphasizes the increasing importance of the 3<sup>rd</sup> pillar pension funds and necessity of their assessment in Lithuania. Identified private pension funds evaluation criteria and the expert survey carried out in this paper allowed to ascertain main parameters of evaluation and weigh them according to their importance. Moreover, there is used Delphi method together with Kendall's coefficient of concordance to assure that the attitude of experts and the results of survey are reconcilable and statistically significant. Finally, created model is tested using funds data analysis to assess its reliability. It is expected that scientific recommendations made based on the analysis of the theoretical studies and empiric research data will assist assessing the 3<sup>rd</sup> pillar pension funds. In addition, it is supposed that these results will help investors to make a right decision choosing a particular 3<sup>rd</sup> pillar pension fund and will be a useful tool to encourage investments into private pension funds in the future.

**Keywords:** private pension funds, the 3<sup>rd</sup> pillar pension funds, additional voluntary saving, risk and return, the Sharpe ratio, expert survey, Delphi method.

**JEL Classification:** J32, G11.

### Introduction

Financial sustainability of national pension system is one of the key concerns in contemporary social insurance discourse. We can describe financial sustainability as a long-term validity to carry out financial liabilities or the capacity to maintain an adequate level of consumption for beneficiaries or the insured if an insured event occurs. Governments and international organizations have focused on designing or reforming national pension systems in recent years, so they can stimulate private pension schemes eventually. While the State Social Insurance Board of Lithuania (SODRA) administrates public pension people receive less than half of their former salary in the retirement age, and it is a sharp decline change in income. Voluntary pension saving plans take a more important role as people are willing to give up some of their income and consumption in the good times by investing in private pension funds (further PF) in return for future benefits, which is typical for developed countries and are the key indicators of pension reforms all over the world.

The aging population, decline in figures of social contributors as well as funding adequacy are highly discussed all over the world. Many people argue this issue and consider the possibilities of increasing income after retirement in the best and the most efficient way. Academic literature analysis (Pension Reform... 2006; Yermo 2002; Alptekin 2009; Anatolin 2008; Olejnik 2008; Eichhorst *et al.* 2011; Private pension schemes 2010; Lietuvos Respublikos papildomo... 2012; Lietuvos Respublikos pensijų... 2012) revealed that definitions of private PF vary across the world and among Lithuanian authors. It seems that authors point out one private PF feature leaving others behind. To sum up, it can be said that a private pension fund is a specialized investment fund operated by the managing company, in which contributions of individuals are accumulated for retirement and are legally separated from the managing company assets.

Many researchers examined various aspects of Lithuanian private PF. Bartkus (2007), Jokšienė and Žvirblis (2011), Šostakas *et al.* (2006) have focused their research on the features of private PF evaluation criteria. Bitinas (2011) and Gudaitis (2009) have dealt with the benefits, financing, reform strategy and efficiency of private PF. However, either these authors analyse private PF in general or the 2<sup>nd</sup> pillar PF but not the 3<sup>rd</sup> pillar separately<sup>1</sup>. Foreign specialists working in this field are the following: Alptekin (2009), Anatolin (2008), Blanc (2011), Eichhorst *et al.* (2011), Morse (2011) and others. It should be noted that many working papers related to the 3<sup>rd</sup> pillar retirement products in Europe are prepared by the European Commission.

The scientific novelty lies in the complex and systematic approach of the research of evaluation methods from the perspective of potential and current participants of the 3<sup>rd</sup> pillar PF. Private PF have been operating for only about ten years or even less, since 2007, in Lithuania. The short period of private PF activities is a limitation of the research. Consequently, a created model might not be as precise as it would be within a longer analysed period.

The aim of this study is to evaluate Lithuanian 3<sup>rd</sup> pillar PF performance results. Moreover, this research emphasizes that the importance of the 3<sup>rd</sup> pillar PF is increasing and persons have to choose a PF being conscious and having enough knowledge about the performance of additional voluntary PF. In addition, this research seeks to prove the necessity of the evaluation methodology of 3<sup>rd</sup> pillar PF. There are presented main ratios that best describe private PF activities based on the literature analysis in the first part. There evaluation methodology was created and presented in the the second part. The selected experts establish the main criteria for PF activities evaluation and endue with comparative weights corresponding to their significance. The assessment of 3<sup>rd</sup> pillar PF activities in the period 2004–2012 considering risk and return is made after statistical analysis of main ratios, ranking of these ratios and adjusted by comparative weights, in the third part. This helps to prove the 3<sup>rd</sup> pillar private PF evaluation model that could help for potential and existing private pension system participants to decide on option of 3<sup>rd</sup> pillar PF.

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<sup>1</sup> According to The World Bank (Averting the... 1994) a multi-pillar national pension system consist from: a publicly managed system with mandatory participation and the limited goal of reducing poverty among the elderly (1<sup>st</sup> pillar); a privately managed, mandatory savings system (2<sup>nd</sup> pillar); voluntary savings (3<sup>rd</sup> pillar).

## 1. Private pension funds valuation criteria

Stankevičienė and Bernatavičienė (2012) state that evaluation criteria of activities of investment fund can be divided into two main groups – investment fund activity efficiency assessment considering *profitability and risks* criteria and investment fund activity efficiency assessment considering *fund management and characteristics of its managing company*. These groups of evaluation are proper for the 3<sup>rd</sup> pillar PF either, as a PF is the same investment fund held by managing company, whose main purpose is to invest profitably. The main difference is that the 3<sup>rd</sup> pillar PF have tax benefit and the accumulated contribution is normally intended for retirement.

All factors included in profitability and risk criteria of PF depend on rules prepared by the managing company and market situation. For example, PF performance depends on the ability of the managing company to manage risks and operate profitably, while the managing company cannot directly influence factors in the second group. Indeed, the number of participants and total asset value depend on the reputation of the pension company and its overall performance, not only on return.

As mentioned above, the operating period of Lithuanian private PF is relatively short comparing with other countries – only a decade, so it is obvious why the evaluation method of private PF has not been defined yet. In addition, not all criteria can be involved in the evaluation of Lithuanian 3<sup>rd</sup> pillar PF due to the following reasons:

- retirement program options of withdrawal does not exist in practice in Lithuania, participants use only one method and this can be explained by uncertainty and short term performance of PF;
- experience of fund managers – in Lithuania fund managers are banks and insurance companies, funds have also been operating for a very similar period, about 10 years. Due to this, such criteria will not reveal any informative results;
- opinion of other related parties, which is a qualitative indicator and can be measured only with help of a survey, in order to have an up-to-date model the survey should be taken continuously due to changes of society opinion, moreover, a survey is an expensive and time consuming method – due to these reasons, it was decided to exclude this indicator and bear in mind that the number of participants in the fund is representative enough.

After the investigation of PF valuation criteria based on logical academic literature analysis and synthesis, the following general private PF evaluation indicators and their assessments were distinguished (Table 1).

It is important to have a systematic evaluation model as comparison of only one criterion does not provide any helpful information about fund performance, moreover, such simple comparison can form misleading impression about the activity of a PF.

**Table 1.** General evaluation indicators of 3<sup>rd</sup> pillar PF and their assessment

| Evaluation indicator                        | Assessment  |
|---|---|
| Fund performance related to risk and return | The Sharpe ratio – a higher rate is treated more favorably. Selected because of its frequency of use and advantages.  |
| Investment strategy                         | The number of different investment strategies in the same managing company – a higher number of options is treated more favorably.  |
| Number of participants in the fund          | Number of participants – a higher number is treated more favorably. Shows the ability of the managing company to attract participants, as well as their general opinion.  |
| The net asset value                         | The net asset value (NAV) – a higher rate is treated more favorably.  |
| Investment risk of the fund                 | Standard deviation – a lower rate is treated more favorably.  |
| Fund fees                                   | Total expense ratio (TER) – a lower rate is treated more favorably. Selected because it includes the majority of fees. Tax on contributions and a management fee on assets in percentage in case the TER is not counted, in order to receive comparable data. A lower rate is treated more favorably. |

*Source:* created by authors based on Ramasamy, Yeung (2003), Naczyk (2013), Nijhuis (2013), Alptekin (2009), Stankevičienė, Bernatavičienė (2012).

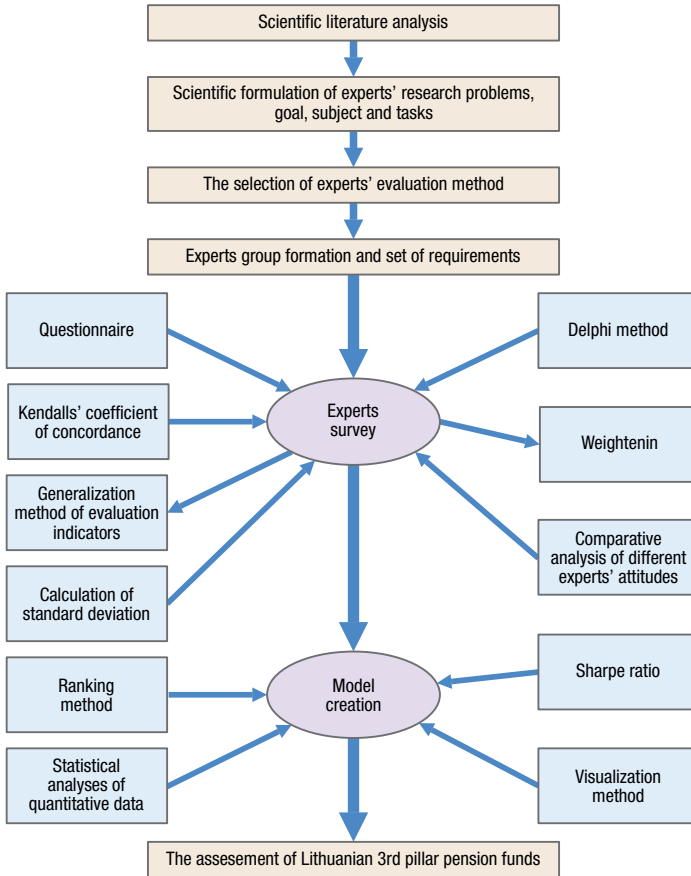
## 2. Methodology

The complex and systematic research will be done to evaluate Lithuanian 3<sup>rd</sup> pillar PF and create an assessment model from the perspective of potential and current participants of private PF (Fig. 1).

### *Expert survey and criteria weighing*

The expert survey method is widely described and is often referred to analysis of Lithuanian pension system. Moreover, expert evaluation is commonly used to investigate problem, process or phenomenon, which requires specialized knowledge and skills in order to present reasonable conclusions of results and future recommendations. Expert assessment is regarded as a generalized opinion of an expert group which is gathered employing specialists-experts' knowledge, experience and intuition. Expert assessment method is the procedure that requires coordination of expert opinions and achievement of common solutions (Prioritetinė Lietuvos... 2008). Moreover, the expert survey enables to create a more precise 3<sup>rd</sup> pillar PF evaluation model, as academic literature emphasize that model creation should be done following quantitative and qualitative perspective (Savickaitė, Valvonis 2007), thus experts assessment of the objectives and criteria for determining the weights are considered to be a qualitative indicator (Miesbauer, Weinreich 2013).

Scientific literature present various expert evaluation stages, usually distinguishing the following expert evaluation process (Prioritetinė Lietuvos... 2008):



**Fig. 1.** The process of the research  
*Source:* created by authors.

1. The scientific formulation of problems, goal, subject and objectives;
2. *Selection of expert evaluation method.* An active approach has been chosen following the best practice in similar cases, which depends on the initiative of the researcher who actively interacts with experts while questioning them and taking part in discussions to gather objective information about considered objects and alternatives. Many scientists agree that the opinion of some experts is more reliable than of a single one and the advantage is that the problem is fully analysed assessing the qualitative and quantitative aspects (Miesbauer, Weinreich 2013; Berube *et al.* 2011; Prioritetinė Lietuvos... 2008). Consequently, an expert group survey using the Delphi method, which is one of the most popular expert surveys, will be conducted (Berube *et al.* 2011; Prioritetinė Lietuvos... 2008). This method is described as a forecasting method based on the results of questionnaires sent to a panel of experts, where several rounds of questionnaires are sent out, and anonymous answers are collected and shared with the group after each round. Moreover, this method was selected to smooth the dis-

advantage of a group expert survey, when the opinion of narrow field professionals may differ, leading to one and the same question providing different answers. The Delphi method allows collecting opinions from a diverse set of experts without bringing them face to face.

*Expert group formation and requirements.* Many scientists believe that the optimal size of the group is from 8 to 10 experts (a very large number of experts complicates consensus formation and prevents an optimal desired result). Having this number it is enough to reach 85–90 percent of confidence level (Prioritetinė Lietuvos... 2008). Such confidence level is sufficient and consequently, eight experts were surveyed who had to meet the following requirements of competence and experience in the analysed field: higher education in economics or finance, a general financial broker license, at least three years' work experience during the last five years in personal finance with Lithuanian 3<sup>rd</sup> pillar PF.

As it is also recommended to involve certain related representatives, so there was included a representative of the 2<sup>nd</sup> pillar PF managing company which does not offer 3<sup>rd</sup> pillar PF. Employees of the following companies have been questioned: AB SEB bankas, UAB SEB investicijų valdymas, AB DNB bankas, UAB DNB investicijų valdymas, AB Citadele bankas, AB Swedbank, AB bankas Finasta, UAB MP Pension Funds Baltic.

*Expert survey.* Eight experts were asked to respond to the questionnaire: The first three questions are intended to identify demographic data: evaluation of their gender, age, working position and employer; The next four questions are intended to clarify if an expert has a proper qualification and work experience; The last questions should help to achieve harmonized weights of evaluation indicators of PF (Annex 1).

The Delphi method allows to question experts as many times as a researcher thinks is needed, firstly, the average assessment and dispersion index estimates of the first round answers have to be calculated and reported to all experts (for example, the distance between the extreme quartiles) and if there are further suggestions regarding indicators, they should be considered and discussed with all experts. After reaching an agreement new indicators are included. Secondly, those experts who have provided estimates of the extremities are asked to justify their opinions. These justifications are communicated to all experts (while maintaining anonymity) and the second round of the questionnaire is provided only with the question about additional indicators if there are such.

3. Compatibility analysis of expert assessment. As it was mentioned before, one of the group expert survey disadvantages is that experts' valuations can differ. The Delphi method can smooth this disadvantage but not eliminate it. Due to this, the compatibility analysis has to be carried out. One of the most commonly used compatibility criterion is Kendall's coefficient (Prioritetinė Lietuvos... 2008), which is calculated as follows (1):

$$W = \frac{12S^2}{m^2(k^3 - k)} , \quad (1)$$

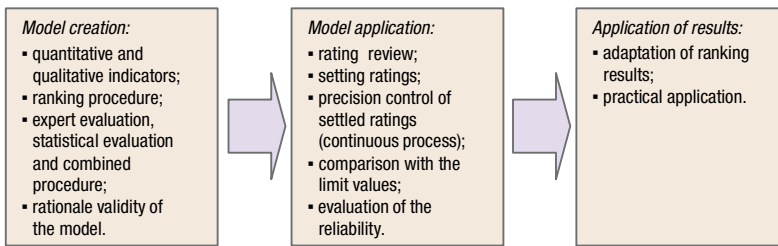
where:  $m$  – the number of experts;  $k$  – the number of examined of objects;  $S^2$  – deviation of the average rank of squares sum.

Concordance coefficient  $W$  varies from 0 to 1 ( $0 < W < 1$ ), 0 means complete incompatibility 1 – full compatibility.

**Model creation: ranking method**

Ranking method was chosen for the creation of the systematic 3<sup>rd</sup> pillar PF evaluation model. Consequently, a determination was influenced by the fact that all biggest banks and many smaller banks use a ranking method for assessing credit risk (Savickaitė, Valvonis 2007). To have a reliable ranking model, the following steps must be made (Fig. 2):

The described steps are followed. As quantitative and qualitative indicators have already been analysed in previous section, the next step is ranking.



**Fig. 2.** The process of model creation

Source: made by authors according to Savickaitė, Valvonis (2007), Pranckevičiūtė (2007), Li *et al.* (2012).

Ranking is a process of giving a specified rank prioritizing the objects under consideration and the procedure consists from the following (Li *et al.* 2012):

- Firstly, a table including PF and their evaluation indicators is made;
- Secondly, relevant indicators are found in annual reports of PF and the Sharpe ratio was calculated. This ratio focuses on the return generated by the portfolio in comparison to the amount of risk taken and is formulated as follows (Jurevičienė, Samoškaitė 2012):

$$S_i = \frac{R_i - R_f}{\sigma}, \tag{2}$$

where:  $R_i$  – is the average return of the PF;  $R_f$  – is risk-free rate of return;  $\sigma$  – is the standard deviation of the PF average annual return.

The Sharp ratio (2) was computed in annual terms. It was computed once and then ranked. The rate of Lithuanian treasury bills was selected as a risk-free rate of return<sup>2</sup>. Later, according to calculated or found PF valuation ratios, the 3<sup>rd</sup> pillar PF are ranked.

- Thirdly, each index value is assigned a rating score. The higher rating score is given to the better indicator of the PF. Value of the ranking point may vary depending on the number of PF (from 1 to n). The best rating score is 1. However, there can be

<sup>2</sup> <https://www.lb.lt/vvp/default.as>

cases when PF have the same rating score in the corresponding target. For example, the rates are 2, 1, 2, 2 and 2 respectively. There are four matching indicators. If PF are treated more favourably when rates are higher, rate 2 shares positions from one to four. In such a case, the average number of taken positions is calculated which leads to  $(1 + 2 + 3 + 4) / 4 = 2.5$  and score 1 is ranked as 5;

- Finally, after adjusting all scorers with weights of PF by all targets, the total score of each fund is calculated and divided by the number of indicators. In addition, this number is determined by a separate PF rating, where a lower number means a better evaluation.

According to Li *et al.* (2012), a simple ranking method either does not provide complete evaluation or cannot be effectively applied to decision-making processes. Due to this, a modified model depending on data with criteria weighted, which will be reached with help of expert survey, was constructed.

### **3. Analysis of Lithuanian 3<sup>rd</sup> pillar pension funds**

#### *Expert survey results*

The main goal of the expert survey was to achieve harmonized weights of Lithuanian 3<sup>rd</sup> pillar PF evaluation criteria to develop a model.

*Selection of Experts.* 8 experts from different financial institutions (banks and pension managing companies) were questioned. All experts met the following requirements:

- Position – personal banker, finance broker, financial consultant;
- Education – higher university in economics or finances (majority have master degree);
- Work experience – not less than 3 years during the last 5 years;
- Additional qualification – general financial broker license.

*Expert survey period:* I phase: experts were asked to fill in a questionnaire in September 2013. II phase: experts were informed of other respondents' opinion about the 3<sup>rd</sup> pillar PF evaluation criteria and ranks in October 2013. Experts had to fill in a table with provided agreed rating scores and to give only the weight for criteria.

*Expert assessment of the compatibility analysis.* In order to have a precise model of the 3<sup>rd</sup> pillar PF evaluation, it is important to check if the opinion of experts is consistent (Table 2).

Kendall's coefficient of concordance was calculated according to (2) formula and the result was  $W = 0.82$ .

Due to Delphi method, experts were proposed other opinions and some issues were discussed with experts whose opinions differed from others. In addition, experts were asked to weigh the 3<sup>rd</sup> pillar PF criteria according to the provided rating score. For example, the Sharpe ratio had the highest rating score, so this criterion is supposed to have the biggest weight. The total amount of 8 criteria weights should be 100 percent. Finally, the average weighting meanings of each criterion were counted and these results were used in the evaluation model of additional voluntary PF (Table 3).



**Table 2.** Data of expert evaluation and result calculation of the compatibility analysis

| Expert No.            | Rating scores |                     |                        |                     |                    |                     |                      |                         |
|-----------------------|---------------|---------------------|------------------------|---------------------|--------------------|---------------------|----------------------|-------------------------|
|                       | Sharpe ratio  | Investment strategy | Number of participants | The net asset value | Standard deviation | Total expense ratio | Tax on contributions | Management fee on asset |
| 1                     | 1             | 8                   | 7                      | 6                   | 5                  | 4                   | 2                    | 3                       |
| 2                     | 1             | 8                   | 4                      | 7                   | 2                  | 3                   | 6                    | 5                       |
| 3                     | 1             | 8                   | 7                      | 4                   | 2                  | 3                   | 5                    | 6                       |
| 4                     | 1             | 8                   | 7                      | 5                   | 2                  | 6                   | 3                    | 4                       |
| 5                     | 1             | 8                   | 7                      | 6                   | 2                  | 5                   | 4                    | 3                       |
| 6                     | 1             | 8                   | 7                      | 6                   | 2                  | 5                   | 4                    | 3                       |
| 7                     | 1             | 8                   | 7                      | 6                   | 2                  | 3                   | 4                    | 5                       |
| 8                     | 1             | 8                   | 7                      | 3                   | 2                  | 4                   | 5                    | 6                       |
| Sum of weights        | 8             | 64                  | 53                     | 43                  | 19                 | 33                  | 33                   | 35                      |
| $\sum_{i=1}^m x_{ij}$ |               |                     |                        |                     |                    |                     |                      |                         |
| An average weight $a$ | 36            | 36                  | 36                     | 36                  | 36                 | 36                  | 36                   | 36                      |
| Squared deviations    | 784           | 784                 | 289                    | 49                  | 289                | 9                   | 9                    | 1                       |
| $W = 0.823660714$     |               |                     |                        |                     |                    |                     |                      | Sum $S^2 = 2214$        |

Source: created by authors.

According to results the most important ratios, evaluating PF, are Sharpe ratio (18.38 average weight) and Standard deviation (16.00 average weight). The next are total expense ratio (14.63 average weight) and net asset value of the fund (12.88 average weight). In experts' opinion, this model is suitable for evaluating the same strategy 3<sup>rd</sup> pillar PF, whereas it can provide misleading information comparing different strategy PF as the only criterion – the Sharpe ratio is proper to compare different strategies.

The experts agree that PF with different strategies should be evaluated separately. Moreover, the person who is choosing a strategy is provided with the following information to be considered: how long it is left until the retirement age, what is acceptable risk, if this money will be the only source of income in old age, if it is long-term investment or not. Consequently, firstly, a person should evaluate the level of acceptable risk. For example, many personal bankers use a SIP<sup>3</sup> questionnaire, which is a standardized invest-

<sup>3</sup> [http://www.lb.lt/del\\_asmenu\\_per\\_kuriuos\\_finansu\\_maklerio\\_imeses\\_ir\\_kredito\\_istaigos\\_teikia\\_klientams\\_investicines\\_paslaugas\\_kompetenciju\\_ribu](http://www.lb.lt/del_asmenu_per_kuriuos_finansu_maklerio_imeses_ir_kredito_istaigos_teikia_klientams_investicines_paslaugas_kompetenciju_ribu)

**Table 3.** Data of expert assessment and weighing results of the 3<sup>rd</sup> pillar PF evaluation criteria

| Expert No.            | Weight, %        |                         |                            |                         |                        |                         |                          |                             |
|-----------------------|------------------|-------------------------|----------------------------|-------------------------|------------------------|-------------------------|--------------------------|-----------------------------|
|                       | Sharpe ratio (1) | Investment strategy (8) | Number of participants (7) | The net asset value (4) | Standard deviation (2) | Total expense ratio (3) | Tax on contributions (5) | Management fee on asset (6) |
| 1                     | 18               | 7                       | 8                          | 13                      | 17                     | 15                      | 11                       | 11                          |
| 2                     | 19               | 7                       | 8                          | 13                      | 15                     | 14                      | 12                       | 12                          |
| 3                     | 17               | 7                       | 11                         | 13                      | 15                     | 14                      | 12                       | 11                          |
| 4                     | 20               | 7                       | 9                          | 13                      | 15                     | 14                      | 12                       | 10                          |
| 5                     | 22               | 7                       | 9                          | 13                      | 16                     | 14                      | 10                       | 9                           |
| 6                     | 17               | 8                       | 7                          | 13                      | 16                     | 15                      | 12                       | 12                          |
| 7                     | 16               | 9                       | 10                         | 12                      | 16                     | 15                      | 11                       | 11                          |
| 8                     | 18               | 6                       | 8                          | 13                      | 18                     | 16                      | 12                       | 9                           |
| Sum of weights        | 147              | 58                      | 70                         | 103                     | 128                    | 117                     | 92                       | 85                          |
| $\sum_{i=1}^m x_{ij}$ |                  |                         |                            |                         |                        |                         |                          |                             |
| An average weight     | 18.38            | 7.25                    | 8.75                       | 12.88                   | 16.00                  | 14.63                   | 11.50                    | 10.63                       |

Source: created by authors.

ment proposal: a person is asked to answer standard questions to provide information about his or her knowledge and experience in the field of investment, financial situation, risk tolerance degree, goals of investment services and other information relevant to the customer profile. Later, financial consultants give some additional questions and investment proposal can be prepared.

### ***Brief overview of the 3<sup>rd</sup> pillar pension funds in Lithuania***

According to the Bank of Lithuania, there were nine 3<sup>rd</sup> pillar PF operating on December 31st 2012 in Lithuania. They were managed by 5 managing companies and their performance was supervised by the Bank of Lithuania. During the analysed period (2004–2012) there were little changes considering PF and their managing companies. As it was the beginning of existence of private PF in Lithuania, almost every year new PF started operating<sup>4</sup>. The Bank of Lithuania provides the following classification and strategies depending on the stock share in the portfolio (Table 4).

<sup>4</sup> The Supervisory Authority of the Bank of Lithuania gave a prior permission to liquidate Citadele papildomo savanoriško pensijų kaupimo fondas on April 17<sup>th</sup> 2013. Having this in mind, the performance of this fund was analysed, as historical data are available despite the fact that it is impossible to invest into this fund.

**Table 4.** Lithuanian 3<sup>rd</sup> pillar PF data, 2012

| The managing company                        | The name of the additional voluntary PF (the 3 <sup>rd</sup> pillar) | Date of establishment | The net asset value, million LTL | The number of participants | The part of investment in stocks |
|---|--|-----------------------|----------------------------------|----------------------------|----------------------------------|
| BOND PF                                     |  |                       |                                  |                            |                                  |
| PCL "Finasta Asset Management"              | Finasta bond pension plus  | 2004                  | 4.56                             | 1 147                      | 0%                               |
| BALANCED PF                                 |  |                       |                                  |                            |                                  |
| PCL "DNB investicijų valdymas" <sup>1</sup> | DNB papildoma pensija <sup>2</sup>                                   | 2004                  | 25.52                            | 12 771                     | until 50%                        |
| PCL "MP PF Baltic"                          | MP MEDIO III   | 2007                  | 2.15                             | 291                        | until 70%                        |
| PCL "Citadele Asset Management"             | Citadelė papildomo savanoriško pensijų kaupimo fondas <sup>3</sup>   | 2005                  | 0.52                             | 52                         | until 30%                        |
| PCL "SEB investicijų valdymas" <sup>4</sup> | SEB pensija 1 plus <sup>5</sup>                                      | 2004                  | 16.18                            | 1 538                      | until 30%                        |
| EQUITY PF                                   |  |                       |                                  |                            |                                  |
| PCL "DNB investicijų valdymas"              | DNB papildoma pensija 100 <sup>6</sup>                               | 2007                  | 2.33                             | 1 238                      | until 100%                       |
| PCL "Finasta Asset Management"              | Finasta equity pension plus  | 2004                  | 6.23                             | 1 645                      | until 100%                       |
| PCL "MP PF Baltic"                          | MP EXTREMO III   | 2007                  | 3.48                             | 829                        | until 100%                       |
| PCL "SEB investicijų valdymas"              | SEB pensija 2 plus <sup>7</sup>                                      | 2004                  | 47.46                            | 9 073                      | 60–100%                          |
| Total                                       |  |                       | 108.44                           | 28 584                     |                                  |

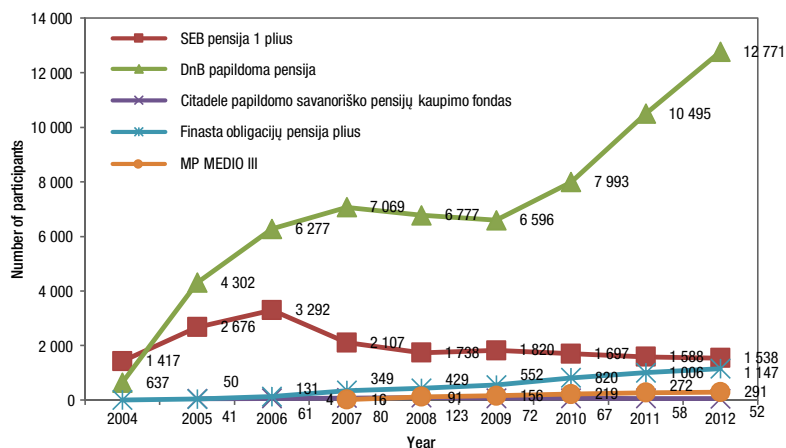
**Notes:** <sup>1</sup>DNB asset management; <sup>2</sup>DNB additional pension; <sup>3</sup>Citadele additional voluntary pension accumulation fund; <sup>4</sup>SEB asset management; <sup>5</sup>SEB pension 1 plus; <sup>6</sup>DNB additional pension 100; <sup>7</sup>SEB pension 2 plus.

*Source:* The Bank of Lithuania.

The results of analysis of all evaluation criteria indicated in the Table 3 are presented below according to different strategies of Lithuanian 3<sup>rd</sup> pillar PF. As there is only one bond PF, it was evaluated together with balanced PF. The analysis is made using the data of all nine 3<sup>rd</sup> pillar PF annual reports for the period from their establishment till 2012.

#### **Results of bond and balanced funds analysis**

Four balanced and one bond 3<sup>rd</sup> pillar PF operate in 2012 (Table 4).



**Fig. 3.** The change of participants in bond and balanced 3<sup>rd</sup> pillar PF during 2004–2012  
 Source: created by authors according to annual reports of PF.

### Movement of Funds Participants

The number of participants in “DnB papildoma pensija” decreased by 4.13 percent in 2008 and by 2.67 percent in 2009, while the number of participants in “Finasta bond pension plus” and MP MEDIO III was increasing during all analyzed period (Fig. 3). However, “DnB papildoma pensija” had the biggest number of participants among bond and balanced 3<sup>rd</sup> pillar PF and, moreover, in 2011–2012 this fund had the biggest number of participants among all 3<sup>rd</sup> pillar PF.

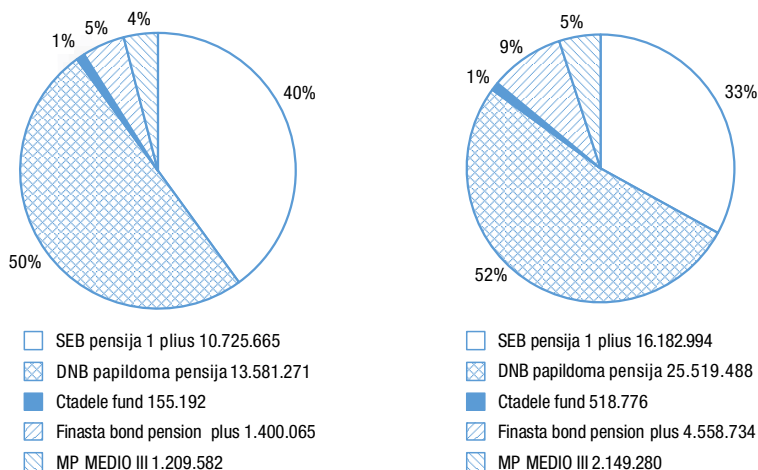
The number of “Citadele papildomo savanoriško pensijų kaupimo fondas” (further Citadele fund) participants was slightly increasing from the start of operating in 2005 till 2008 and declining from 2009 till 2012. Moreover, the average number of participants in Citadele fund during all period was only 66 participants and it was the main reason to stop operating in 2013. It means that this fund could not attract participants and it was the main reason to suspend activities in 2013. The number of participants in “SEB pensija 1 plus” was increasing from 2004 till 2006 and then shrinking till 2012 with a slight increase in 2009. Consequently, the fall of participants from 2006 till 2012 resulted in 53.28 percent.

### The trend of the net asset value

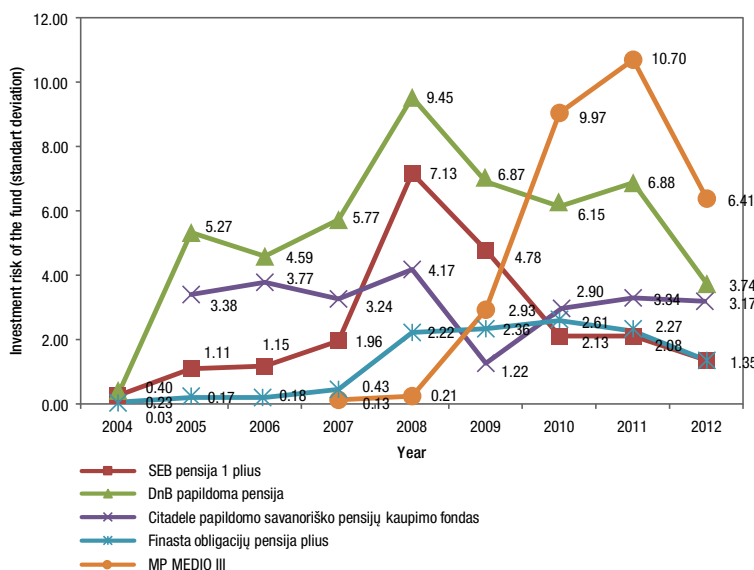
The structure of net asset value between bond and balanced PF is similar to the structure of participants due to direct correlation. The biggest fall was in “SEB pensija 1 plus” fund when the net asset value decreased from 40 percent in 2008 to 33 percent in 2012, while the biggest increase was in “Finasta bond pension plus” from 5 percent in 2008 till 9 percent in 2012. During all the period “DnB papildoma pensija” held the biggest share of total net asset value (about 50 percent) (Fig. 4).

### Fund Investment Risk

Standard deviation was selected as a criterion for fund investment risk evaluation. The slightest fluctuation of standard deviation during 2004–2012 was noticed in Citadele fund and “SEB pensija 1 plus” (Fig. 5).



**Fig. 4.** The structure of bond and balanced 3<sup>rd</sup> pillar PF, in 2008 on the left side and in 2012 on the right side  
 Source: created by authors according to annual reports of PF.



**Fig. 5.** Change of bond and balanced 3<sup>rd</sup> pillar PF standard deviation during 2004–2012  
 Source: created by authors according to annual reports of PF.

In 2004–2007 the standard deviation was fluctuating mostly due to higher return gains and this fluctuation was positive. However, in late 2007 standard deviation started fluctuate rapidly due to uncertainty in global financial markets and slowdown of world economy and only in late 2012 all bond and balanced 3<sup>rd</sup> pillar PF had a positive average annual return.

However, such results of standard deviation alone do not show which fund performed better. Therefore, this criterion will not be analysed separately and will be considered together with the Sharpe ratio.

### Fund fees

The in-depth analysis of various opinions showed that the most important fees are management fee on asset and fee on contributions. The management fee is more relevant to those participants who have already accumulated a significant amount of money and will continue to participate in the fund for a long time, while tax on contributions is more important for the participants who often transfer money to PF and are planning to withdraw contributions from the fund in early future. The lowest rate of management fee during 2005–2012 applied Citadele fund. In 2005 it was 0.99 percent and after February 10<sup>th</sup> 2006 the managing company decided not to tax contributions and asset reducing this fee to 0 percent. In 2004–2012 the highest management fee applied “DNB papildoma pensija“, which was 1.5 percent.

In 2004 the lowest fee on contributions applied “Finasta bond pension plus” (1 percent), in 2005 – Citadele fund (0.99 percent) and during 2006–2012 – Citadele fund (0 percent). The highest rate during all the analysed period was maintained by “DNB papildoma pensija”, varying from 2 till 3.95 percent depending on the amount: for amounts above 2000 litas<sup>5</sup>, the rate was 2 percent, between 1000 and 1999.99 litas – 2.5 percent and below 1000 litas – 3.95 percent. The maxim rate was taken into account in this analysis because the average amount of accumulated asset by a person in 2012 was 3097 litas and people are likely to contribute more often a smaller amount into their PF accounts.

Moreover, the total expense ratio (TER) was analysed to consider other fees, which are deducted from the assets owned by the participants. In 2004–2006 highest rates of TER were maintained by “DNB papildoma pensija” and “SEB pensija 1 plus” (Fig. 6).

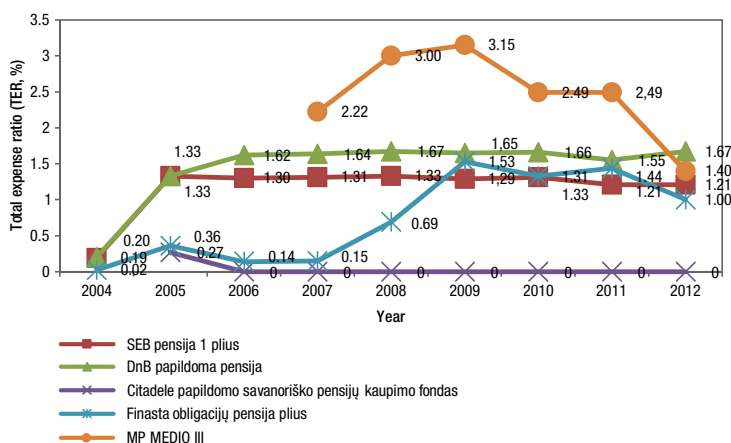


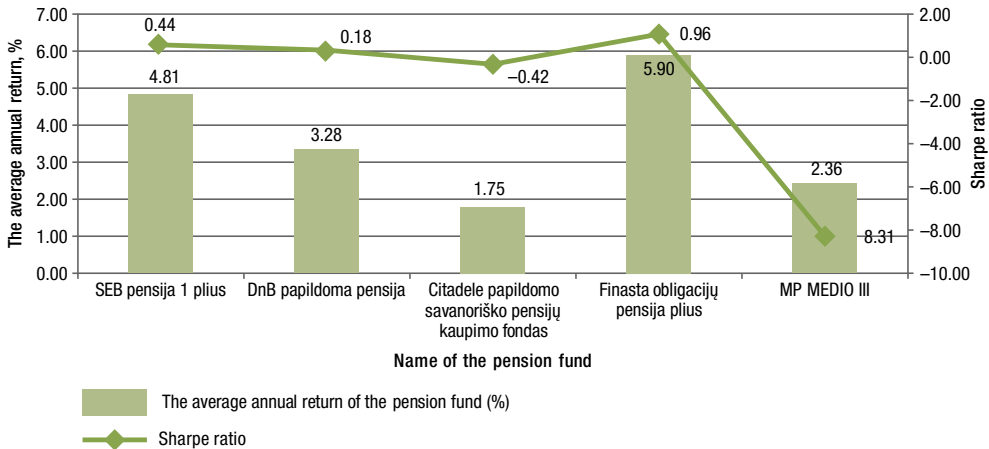
Fig. 6. Change of bond and balanced 3<sup>rd</sup> pillar PF total expense ratio during 2004–2012  
 Source: created by authors according to annual reports of PF.

<sup>5</sup> including Citadele fund.

In 2007–2011 MP MEDIO III had a significantly higher rate of TER than other funds. The situation changed in late 2012 when the highest rate of TER was noticed in “DnB papildoma pensija”. The lowest rates of TER were in Citadele fund and “Finasta bond pension plus” PF.

**Fund performance related to risk and return**

The Sharpe ratio shows the return generated by the portfolio in comparison to the amount of risk taken. The Sharpe ratio was analysed during 2007–2012 because all bond and balanced 3<sup>rd</sup> pillar PF were operating and the results can be compared. The calculations showed that the best performance considering risk and return during 2007–2012 showed “Finasta bond pension plus” with the Sharpe ratio 0.96 whereas this fund offers a maximum return on fund unit for one unit of risk (Fig. 7). It is argued that if the Sharpe ratio is greater than 1 – the results are very good, if the ratio is more than 0 – the result is positive, but significant variations are possible. It should be distinguished that “SEB pensija 1 plius” also had good results with Sharpe ratio 0.44.



**Fig. 7.** The average annual return and sharpe ratio of bond and balanced 3<sup>rd</sup> pillar PF during 2007–2012  
 Source: created by authors according to annual reports of PF.

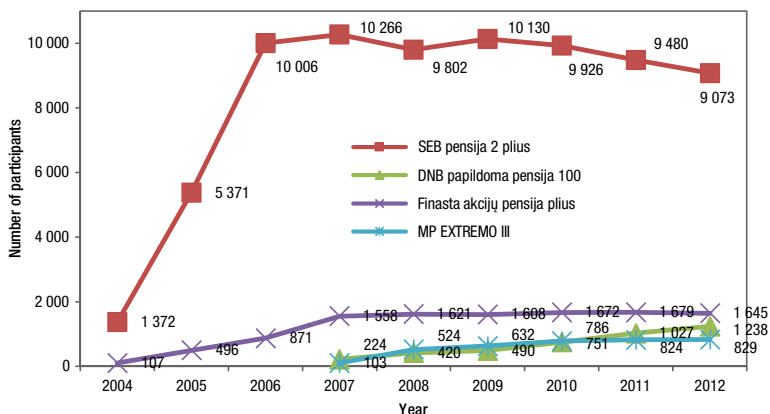
**Results of equity funds analysis**

There were four equity PF in Lithuania in 2012 and they have accumulated more assets than bond and balanced PF together, while the number of participants was higher in bond and balanced PF. This can be explained by the motives of investors who invest in equity PF. In most cases, they have more additional money and can accept higher risk being less sensitive to risk caused by the financial situation. The participants of equity PF are younger than those of bond are and balanced funds.

Investment strategy will not be discussed in this part because it was analysed in the previous section. In addition, fund investment risk will not be analysed separately, only together with the Sharpe ratio to receive precise evaluation results.

### Number of Participants in Funds

The biggest number of participants during the analysed period was in “SEB pensija 2 plus” and its share was more than 70 percent of all participants (Fig. 8). However, a number of participants in this fund shrank from 2007 till 2012 with a slight increase in 2009.



**Fig. 8.** Change of equity 3<sup>rd</sup> pillar PF participants during 2004–2012  
 Source: created by authors according to annual reports of PF.

The opposite results were in “Finasta equity pension plus”, where the number of participants was increasing steadily all the time with slight decline in 2009 and 2012. Finasta increased its number of participants from 7.23 percent in 2004 to 12.87 percent in 2012. Moreover, the number of participants was steadily rising in “DNB papildoma pensija 100” and MP EXTREMO III.

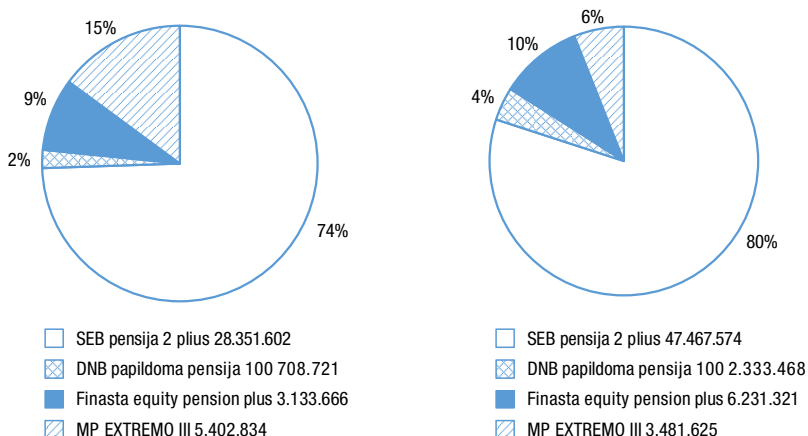
### The trend of the net asset value

The structure of the net asset value in equity PF is closely related to the number of participants. The biggest share of all assets was concentrated in “SEB pensija 2 plus” with 76 percent in 2008 and the share kept growing till 80 percent in 2012 (Fig. 9). However, SEB experienced a drop in assets in 2008 and 2011 by 49.73 and 14.17 percent respectively. Moreover, the biggest decrease of 78.25 percent was faced by MP EXTREMO III in 2009 and its total share of asset has fallen down. Therefore, “DNB papildoma pensija 100” net asset value grew from 2 percent in 2008 until 4 percent in 2012, and “Finasta equity pension plus” net asset value grew from 8 percent till 10 percent during the same period.

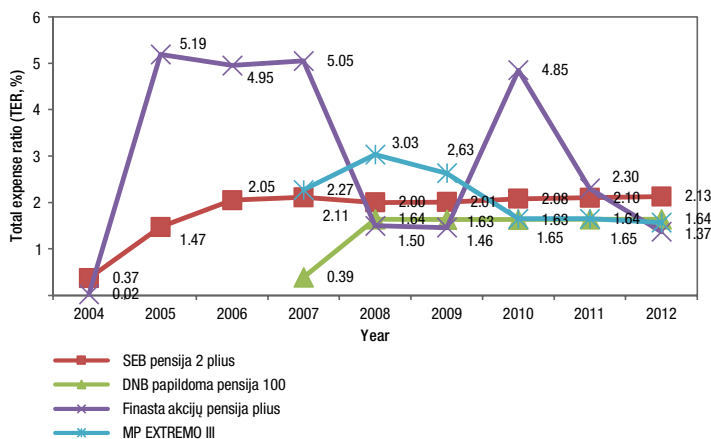
### Fund fees

In 2004–2012 the management fee on assets was the same in all PF and its rate was 1 percent except “DNB papildoma pensija 100” which had the highest fee – 1.5 percent. The lowest fee on contributions was in “Finasta equity pension plus” and MP EXTREMO III (2 percent), while “DNB papildoma pensija 100” had the highest rate of 3.95 percent. The fee on contributions in “DNB papildoma pensija 100” depends on the money transferred, the same as in “DNB papildoma pensija”.





**Fig. 9.** The structure of equity 3<sup>rd</sup> pillar PF in 2008 on the left side and in 2012 on the right side  
 Source: created by authors according to annual reports of PF.



**Fig. 10.** Change of equity 3<sup>rd</sup> pillar PF total expense ratio during 2004–2012  
 Source: created by authors according to annual reports of PF.

The total expense ratio (TER) in equity 3<sup>rd</sup> pillar PF has faced both sharp increases, as well as dramatically decreases (Fig. 10). The highest rates of the TER were in “Finasta equity pension plus”, while the lowest rates were in “DNB papildoma pensija 100” and since 2010 in MP EXTREMO III.

**Fund performance related to risk and return**

Sharpe ratio was positive than negative for a longer time and means that fund managers were gaining higher return than risk-free investment (Table 5). The best performance demonstrated “SEB pensija 2 plus” and “Finasta equity pension plus” because a positive Sharpe ratio was in 6 years out of 9 operating years. Other funds presented similar results – for half of all operating period Sharpe ratio was positive.

**Table 5.** Change of equity 3<sup>rd</sup> pillar PF Sharpe ratio during 2004–2012

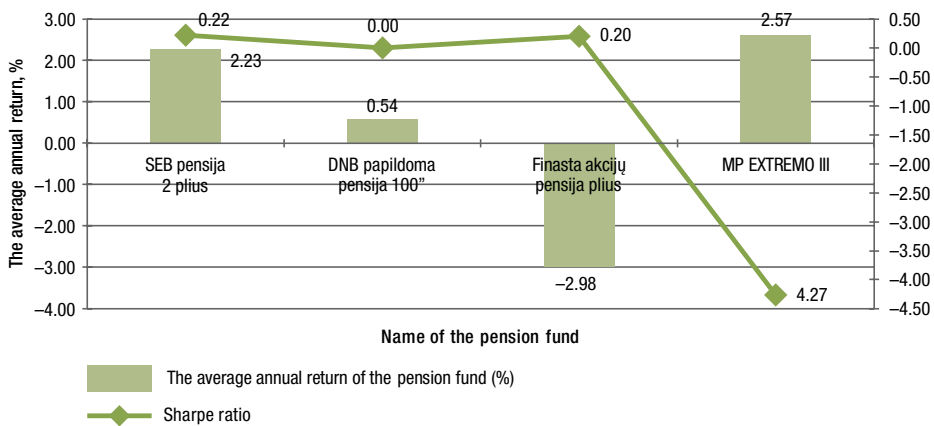
| Year | “SEB pensija 2 plus” | “DNB papildoma pensija 100” | “Finasta aequity pension plus” | MP EXTREMO III |
|------|----------------------|-----------------------------|--------------------------------|----------------|
| 2004 | −0.28                | N/A                         | −47.20                         | N/A            |
| 2005 | 4.13                 | N/A                         | 125.30                         | N/A            |
| 2006 | 1.19                 | N/A                         | 2.71                           | N/A            |
| 2007 | 0.33                 | −0.59                       | 1.58                           | −5.65          |
| 2008 | −1.96                | −2.65                       | −2.72                          | −19.75         |
| 2009 | 1.62                 | 2.10                        | 1.04                           | −0.54          |
| 2010 | 1.02                 | 1.06                        | 1.66                           | 0.66           |
| 2011 | −0.99                | −1.06                       | −1.65                          | −0.90          |
| 2012 | 1.30                 | 1.16                        | 1.27                           | 0.56           |

Source: created by authors according to annual reports of PF.

However, the positive Sharpe ratio during 2007–2012 among equity 3<sup>rd</sup> pillar PF had only “SEB pensija 2 plus” and “Finasta equity pension plus” (Fig. 11). Nevertheless, “Finasta equity pension plus” had a negative average annual return. Moreover, the Sharpe ratios of equity 3<sup>rd</sup> pillar PF during 2007–2012 year were low. This can be explained that funds were affected by the global financial crisis. Consequently, the fund unit’s values significantly decreased and this caused low profitability compared to the risk-free investment. Due to this reason, a person who wants to invest in such funds should think carefully about the risks assumed.

**The assessment of the overall performance**

There were some difficulties evaluating the performance of the 3<sup>rd</sup> pillar PF, some evaluation indicators were not revealed in the annual reports, especially during the first



**Fig. 11.** The average annual return and Sharpe ratio of equity 3<sup>rd</sup> pillar PF during 2007–2012  
Source: created by authors according to annual reports of PF.

year of operating. As a rule, in the first year a PF does not operate the whole year and due to this in further investigations it is suggested not to take into account the first year of a PF operation.

According to the created model “SEB pensija 1 plius” demonstrated the best results in 2004–2012 among bond and balanced PF, while “Finasta equity pension plus” reached the best results during the same period among equity PF (Table 6).

This model proves that a person may take a misleading decision evaluating only one or few indicators if there is no any systematic assessment of 3<sup>rd</sup> pillar PF. For example, considering investment strategy the worst result had Citadele fund and other funds values were equally good, while the biggest number of participants and total net asset value had “DNB papildoma pensija”, however, the least fluctuating of standard deviation and the least total expense ratio had Citadele fund, moreover, the best performance considering risk and return showed “Finasta bond pension plus” among bond and balanced 3<sup>rd</sup> pillar PF.

**Table 6.** Data of expert evaluation and weighing results of the 3<sup>rd</sup> pillar PF evaluation criteria

| Pension Funds                 | Final rating during 2004–2012 | The place during 2004–2012 | Final rating during 2007–2012 | The place during 2007–2012 |
|-------------------------------|-------------------------------|----------------------------|-------------------------------|----------------------------|
| “SEB pensija 1 plius”         | 22                            | 1                          | 10                            | 1                          |
| “SEB pensija 2 plius”         | 56                            | 2                          | 27                            | 2                          |
| “DNB papildoma pensija”       | 64                            | 3                          | 26                            | 4                          |
| “DNB papildoma pensija 100”   | –                             | –                          | 50                            | 4                          |
| Citadele fund                 | –                             | –                          | 19                            | 3                          |
| “Finasta equity pension plus” | 55                            | 1                          | 26                            | 1                          |
| “Finasta bond pension plus”   | 45                            | 2                          | 18                            | 2                          |
| MP EXTREMO III                | –                             | –                          | 44                            | 3                          |
| MP MEDIO III                  | –                             | –                          | 50                            | 5                          |

Source: created by authors.

In addition, such results prove the necessity of the evaluation methodology for 3<sup>rd</sup> pillar PF as PF are now considered by many persons as an attractive alternative to the state social pension. It is important to choose a proper investment strategy and recognise, which fund is better managed. Consequently, the created model enables to evaluate the overall performance of 3<sup>rd</sup> pillar PF.

## Conclusions

The 3<sup>rd</sup> pillar PF will perform an increasing role in the future adequacy and sustainability of pensions. The expert survey (85–90 percent of confidence level) carried out using Delfi method showed that the indicators of Lithuanian 3<sup>rd</sup> pillar voluntary funds

presented in percentage from the most important to the least important are the following: fund performance related to risk and return measured with the Sharpe ratio estimated at 18.38% , investment risk of the fund – standard deviation at 16%, fund fees – total expense ratio at 14.63%, the net asset value at 12.88%, fund fees measured with fees on contributions at 11.50% and management fee on asset at 10,63%, the number of participants in the fund at the end of the year at 8.75% and the number of different investment strategies in the same managing company – 7.25%. The results showed that the Sharpe ratio has the biggest influence on PF results. This can be explained that this ratio focuses not only on the return but on the return generated by the portfolio in comparison to the degree of risk taken. Standard deviation shows how much the return on the fund is deviating from the expected normal returns and helps to evaluate the investment risk of the fund. Total expense ratio is a percentage value that indicates the average allocated net assets to the management costs. These expenses directly reduce the return of the investment and for this reason this indicator is important for investor. Other indicators are less significant because they do not influence results directly are only related to others and not influenced directly by a manager.

The evaluation of performance of Lithuanian 3<sup>rd</sup> pillar PF contains the following stages: finding the most important valuation indicators and their relative weights, processing data of these indicators for all Lithuanian 3<sup>rd</sup> pillar PF during the period of 2004–2012 and ranking them taking into account weights. This model is suggested for evaluation of overall performance of the 3<sup>rd</sup> pillar PF in Lithuania. According to created model the best results in 2004–2012 among bond and balanced PF demonstrated “SEB pensija 1 plius”, while among stock PF, the best results reached “Finasta equity pension plus”.

According to the only criterion – the Sharpe ratio that is proper to compare performance of funds with different strategies – the best result shows “Finasta bond pension plus” (0.96), “SEB pensija 1 plius” (0.44) and “SEB pensija 2 plius” (0.22), while the worst shows MP MEDIO III (–8.1) and MP EXTREMO III (–4.27).

The created model for performance evaluation is applicable for 3<sup>rd</sup> pillar PF of the same strategy and does not guarantee future results. A person can choose the most suitable strategy by taking into consideration the following features: the time lag left till the retirement age (long-term investment or not), the level of acceptable risk, will this money be the only source of income in old age. After selection the suitable strategy an individual is able to choose a particular voluntary saving PF.

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## ANNEX

### Questionnaire

#### 1. What is your gender?

- woman;  man;

#### 2. How old are you?

- Up to 25 years;  
 26–35;  
 36–45;  
 46–55;  
 56–65;  
 More than 65 years.

#### 3. What is the name of organization and your current working position there (please write below)? \_\_\_\_\_

#### 4. What is your currently education?

- Secondary;  
 Advanced vocational education and training or special secondary;  
 Higher education college type;  
 Higher education university type.

**5. What is your title of qualification awarded (please write below)?** \_\_\_\_\_

**6. How many years you have been working in the field of personal finance related with Lithuanian pension funds during the last years?**

- I do not work the last five years in this field;
- Less than 3 years the last 5 years;
- From 3 to 6 years and not less than 3 years during the last 5 years;
- From 3 to 6 years but less than 3 years during the last 5 years;
- From 7 to 9 years and not less than 3 years during the last 5 years;
- From 7 to 9 years but less than 3 years during the last 5 years.

**7. Do you have financial brokerage license or other country's similar certificate?**

- No;
- Yes, broker-dealer license;
- Yes, brokerage consultant license;
- Yes, general financial brokerage license;
- Yes, other country's certificate (Please write the country and the name of certificate)

**8. Please, rank the indicators when 1 means the most important indicator and 8 – the least important in the column “Rating score”. The rating score can be repeated. Also, please weight the indicators from 1 to 100 percent when the sum of all indicators is 100 percent and the higher percent means greater significance of that indicator.**

| No. | Evaluation indicator                        | Assessment  | Rating score | Weight, (%) |
|-----|---|---|--------------|-------------|
| 1.  | Fund performance related to risk and return | – Sharpe ratio – treated more favourably a higher rate. Selected because of its frequent of use and advantages.   |              |             |
| 2.  | Investment strategy                         | – The number of different investment strategies in the same management company – treated more favourably a higher number of options.                          |              |             |
| 3.  | Number of participants in the fund          | – Number of participants – treated more favourably a higher number. Shows the management company's ability to attract participants and their general opinion. |              |             |
| 4.  | The net asset value                         | – The net asset value (NAV) – treated more favourably a higher rate.  |              |             |
| 5.  | Investment risk of the fund                 | – Standard deviation – treated more favourably a lower rate.  |              |             |
| 6.  | Fund fees                                   | – Total expense ratio (TER) – treated more favourably a lower rate. Selected because includes the biggest majority of fees.                                   |              |             |
| 7.  | Fund fees                                   | – Tax on contributions as a percentage. Treated more favourably a lower rate.   |              |             |
| 8.  | Fund fees                                   | – Management fee on assets as a percentage. Treated more favourably a lower rate.   |              |             |

**9. Do you think that all the most important indicators of Lithuanian III pillar pension funds were taken into consideration in question 8?**

Yes;

No (Please write an (–) additional indicator(s) \_\_\_\_\_)

---

**Thank you for your answers.**

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