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Was the Participation in Second Pillar Successful in Lithuania?

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Abstract

The evaluation of participation in Lithuanian private second pillar is analysed in the paper. The analysis is based on qualitative, quantitative and statistical analysis of pension accumulation results during the 9 years period, starting from 2004.

The average monthly wage receiver's scenario is analyzed by calculating the accumulated amount in fully funded private second pillar pension funds and comparing it with the reduced values of first pillar pension, based on pay-as-you-go principle. The results of participation in second pillar are compared with the values of old age pension of person who had not joined the fully funded system. The results disclose that fully funded private second pillar pension funds investment management in general shall be assessed as positive and effective. However, due to the longer life expectancy the capital accumulated by women in fully funded second pension pillar does not exceed the present value of loss in first pension pillar, based on pay-as-you-go principle. The comparison of basic annuities exposes more optimistic result for both genders of participants of fully funded private second pillar pension funds.

Keywords: Old-age pay-as-you-go pension, Private fully funded second pillar pension funds, Pension reform.

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Introduction

From the 1st of January 2004 in Lithuania, the private fully funded second pension pillar was introduced. The second pillar is based on personal fully funded accounts of participants who are allowed to pay a part of their obligatory pension insurance contribution into their personal account instead of paying full contribution into general social insurance fund. The second pillar is administrated by private pension accumulation companies who are managing several pension funds with different investment strategies. Participation in second pillar is fully voluntary in Lithuania. It shall be noted, that at the end of 2012 more than 1 million participants or 96 percent of insured for full pension started to accumulate capital in private second pillar pension funds. The main principles of the pension reform in Lithuania is similar than in many other post-communist countries (Poland, Hungary, etc.) where pension systems were reformed earlier.

Some aspects and results of pension reform in Lithuania were analyzed in several publications (Lazutka, 2008; Jankauskienė & Medaiskis, 2010-2012, Gudaitis, 2009-2013). In this paper authors intend to add one important aspect of pension reform success (or failure) analysis and to evaluate was it rational or not for average wage receiver to join private second pillar in Lithuania by analysing the results of 2004-2012 period.

The paper consists of three parts. At the beginning, it is described how old-age pension amount is reduced in case participant transfers part of insurance contributions into second pillar pension funds. Later, the accumulated amount in fully funded second pillar is calculated during 2004-2012 period. Finally, the comparison of the result is done.

Impact of Participation in Private Fully-funded Second Pillar to Pay-as-you-go Old-age Pension in First Pillar

The old-age social insurance pension is calculated from three components: main, supplement and earnings-related part. Due to participation in second pillar only earning related part is influenced and decreased proportionally by the social insurance contributions paid to the personal second pillar pension account and the participation period. The concrete rule first time was proposed and analysed by Medaiskis & Morkūnienė (2004).

The earnings-related part (hereinafter ERP) of old-age pension of second pillar participant is calculated with reduced coefficients as follows:

$$ERP_T = 0.005 \cdot (k_1 + k_2 + ... + k_{m-1} + d_m k_m + d_{m+1} k_{m+1} + ... + d_n k_n) \cdot D_T \qquad (1)$$

ERP is equal to the sum of collected coefficients (or "pension points") $k_1 + k_2 + ... + k_n$ multiplied by 0.5 percent of the current insured income D_T of the month T of pension payment. If a person joined private fully funded second pillar system from year *m* with contribution rate r_m (see table 1 for details), and

the pension insurance contribution rate for the supplementary part of old-age pension was R_m, then the earnings related component for this year of participation is proportionally reduced by $d_m = (R_m - r_m)/R_m$. For example, in 2010, the contribution rate for the supplementary part of old-age pension was approved by law as 9.3 percent. The participant of the second pillar transfers 2 percent into his/her personal account, hence his/her coefficient of this year k_{2010} is reduced by $d_{2010} = (9.3-2)/9.3 = 0.785$, i.e. by 21.5 percent. The reduction rates are presented in table 2.

Table 1. *Contribution rates to second pillar pension funds (in percent from income taxable by social insurance contribution)*

	2004	2005	2006	2007-2008	2009	2010	2011-2012	2013
Employee's part	2.5	2.5	2.5	2.5	3.0 (2.0)	2.0	2.0	2.5
Employer's part		1.0	2.0	3.0	0	0	0	0
Total	2.5	3.5	4.5	5.5	3.0 (2.0)	2.0	2.0	2.5

Table 2. *Social insurance contribution and reduction rates*

Year	Full social insurance contribution rate into old-age earnings-related part (%) R_m	Transfer into second pillar rate (%) r_m	Reduction rate
2004	10.5	2.5	0.762
2005	10.6	3.5	0.670
2006	10.5	4.5	0.571
2007	9.9	5.5	0.444
2008	9.3	5.5	0.409
2009	9.3	2.5	0.731
2010	9.3	2.0	0.785
2011	9.3	2.0	0.785
2012	9.3	1.5	0.839

Authors selected average monthly gross wage earner's scenario in order to evaluate the differences of values of social insurance old-age pensions for the non-participants of private second pillar pension funds and for participants of private second pillar pension funds, who joined private second pillar system in January 2004 and retired in January 2013 (see table 3 for details). In order to evaluate the results in a wider context it needs to be compared with the gains (or losses) in second pillar. Thus far, the largest share of retirement income is still financed through public pensions, and mandatory social contributions assume a large part of labour costs, thus leaving less scope for additional private pensions. However, the more funded pensions are growing, the more importance they gain in the financial markets, including their ups and downs for pensions and old age income (Ebbinghaus, 2011).

Table 3. *Earnings-related part of old-age pension acquired in years 2004-2012 (in LTL)*

Year	Insured income (LTL)	Monthly gross wage (LTL)	Coefficient (non participant)	Coefficient (participant)
2004	931	1235	1.3263	1.0105
2005	1037	1358	1.3100	0.8774
2006	1148	1585	1.3810	0.7891
2007	1344	1891	1.4073	0.6255
2008	1445	2257	1.5618	0.6381
2009	1488	2157	1.4493	1.0597
2010	1488	2073	1.3929	1.0933
2011	1488	2118	1.4231	1.1171
2012	1488	2154	1.4477	1.2142
Sum of coefficients 2004-2012			12.6994	8.4250
Earnings-related part of monthly pension acquired in years 2004-2014 (LTL)			94.48	62.68
The difference (LTL)				-31.80

The comparison of the calculations may be performed in two ways. Firstly, it might be calculated present value of lost old-age social insurance pension part during the expected life period of retired person in the first pay-as-you-go system and then this value compared with accumulated amount in private fully funded second pillar system. If the accumulated capital exceeds the present value of the loss, then participation in private fully funded second pillar pension funds shall be recognised as successful. Secondly, it might be calculated the annuity according to the accumulated amount in private fully funded second pillar pension funds and compared with monthly loss in the first pillar, based on pay-as-you-go principles. If annuity amount exceeds the loss, then participation in private fully funded second pillar pension funds shall be recognised as successful (at least at the initial period of receiving pension).

In the case of the first approach it shall be taken into account, that social insurance pensions are indexed. Due to this reason, the loss of LTL[1] 31.80 per month (for more details see table 3) in the year 2013 may turn into the loss of much bigger amount in later years. As Lithuania has no strict rule of pensions indexation authors assume that rate of increase of earnings-related part of pension will be more or less overlapped by the discount rate for the calculation of present value of future payments (for example, based on consumer price index). Then the calculation of present value of old-age social insurance pensions payments is simply equal to the product of monthly value today and pensioner's life expectancy (in months). In January 2013 men retired at age 62 and 10 months, women retired at age 60 and 8 months in Lithuania, Based on data of Demographic Yearbook (2012). Authors evaluated the life expectancy

[1]LTL (Litas) is the national currency of Lithuania. 1 EUR is equal to 3.4528 LTL.

of men at retirement age as 178 months and life expectancy of women at retirement age as 265 months.

According to this approach calculated present values of reduced parts of social insurance pensions are presented in table 4. It should be mentioned that losses may be higher or lower dependant on expected pension indexation policy and discount rates used for calculation. Additionally it shall be mention the fact, that due to the bigger life expectancy women loose more than men.

Table 4. *Approximate present values (in LTL) of reduction of earning-related parts of old-age social insurance pensions in the years 2004 – 2012 due to participation in second pillar pension funds*

Man	Woman
-2,074	-3,088
-5,660	-8,427
-16,982	-25,282

The Analysis of Pension Accumulation Results in Private Fully funded Second Pillar

In Lithuania private second pillar pension funds are divided into several groups depending on the investment strategy. The second pillar pension funds, depending on share of investments into equities, are divided into four groups in Lithuania:

- Conservative pension funds (assets under management (hereinafter AUM) are not invested into equities).
- Pension funds investing small part into equities (up to 30 percent of AUM is invested into equities).
- Pension funds investing medium part into equities (30-70 percent of AUM is invested into equities).
- Pure equity pension funds (up to 100 percent of AUM is invested into equities).

Second pillar pension funds' investment results are monitored continuously since the start of pension reform in Lithuania. Pension fund's unit price change is the main indicator used for investment performance evaluation. Pension fund's unit price change is showing how much increased or decreased pension fund participant's assets during the certain period. Pension fund's unit price change is calculated by the formula:

$$\Delta P_f = \frac{P_l - P_i}{P_i} \times 100\% \qquad (2)$$

ΔP_f – Pension fund's unit price change during the period;
P_l – Pension fund's unit price in the end of the period;

P_i – Pension fund's unit price in the beginning of the period.

However, pension fund's unit price change indicator takes into account pension fund assets management fee, but does not take into account the premium fee which is applicable by pension fund. Therefore, pension fund's unit price change does not fully disclose the real investment value change over the time. The importance of charges applied by private fully funded pension funds is widely analyzed by different authors (e.g. see Barr & Diamond, 2010). Comparing the costs of individual accounts in private fully funded system is complex. Moreover, compounding nature of the charges requires detail analysis of private pension systems, in order to evaluate it effectiveness. Because of the effects of compounding, it is easy to underestimate the importance of charges. Due to these reasons, it is appropriate to calculate second pillar pension funds' net investment return by comparing the social insurance contributions' sum transferred to the second-pillar pension funds with the accumulated assets in the pension funds. All applicable fees (contribution fee and asset management fee) are taking into account by calculating net investment returns. In the paper net investment return is calculated by the formula:

$$G = \sum_{t=1}^{l} k_t \times P_t \qquad (3)$$

G – Pension funds' net investment return during period t;
l – Number of periods in which contributions are received to the pension funds;
k_t – Number of pension fund's units, which are bought during one investment period;
P_t – Pension fund unit's price in the end of the period.
k_t is calculated by the formula:

$$k_t = \frac{I_t - M_t}{P_t} \qquad (4)$$

k_t – Number of pension fund's units, which are bought during one investment period;
P_t – Pension fund unit's price in the end of the period;
I_t – Sum of contributions transferred to pension fund during the period;
M_t – Contribution fee average of pension funds', allocated to the same investment risk category.

The results are summarized in table 5. They disclosed that in pure equity pension funds' group net investment return was negative. It also should be mentioned that investment unit price change does not reflect the real ratio between transferred social insurance contributions to pension fund with accumulated capital amount. Therefore, the participant in order to calculate the amount by which accumulated capital is different (higher or lower) from transferred premiums sum shall not rely entirely on widely publicly used investment unit price change indicator.

Table 5. *Accumulated amount (in LTL) and net investment return (in percent) during 2004-2012 period*

Pension fund group	Accumulated amount	Net investment result
Conservative	7587	16.5%
Small part into equities	7998	22.8%
Medium part into equities	7421	14.0%
Pure equity	6320	-3.0%

The analysis of conservative pension funds' performance results disclosed that net investment return was positive during two thirds of analyzed period. The fluctuations of the accumulated capital values in conservative pension funds are minimal compared with other second pillar pension fund groups, which invest assets in higher investment risk asset classes. Different results were observed in pure equity pension funds' group. The net investment return of these funds was positive only during 2/5 of analyzed period. High investment risk pension funds can generate high negative investment results. Moreover, pure equity pension funds have much higher investment values fluctuations comparing with lower risk pension fund groups. In the beginning of accumulation period such negative fluctuations do not have significant effects on participants' accumulated assets. However, in the last stages of accumulation period it can significantly reduce accumulated capital of participant's. As it is seen from the results, the sensitivity to financial markets turbulences, however, depends largely on the scope and portfolio of asset investments. The countries with the largest losses have the highest percentage of equities in their portfolios (Ebbinghaus, 2011). Similar trends are observed in other countries too. The spectacular losses experienced by many pension funds in different countries since the onset of the global financial crisis in late 2008 have been widely noted and debated (e.g. see Hinz *et al*, 2010). The OECD estimated the losses of pension funds in OECD countries to be 5.4 trillion USD or about 24 percent of the value of assets in these countries in 2008 (OECD, 2011). The returns of pension funds in Latin America and Central Europe in 2008 were two-digit negative.

Transformation from Life-Style" pension fund system to "Life-Cycle" pension system would be one of the solutions for existing problem. In "Life Cycle" pension fund system the investment risk would be ongoing and gradually reduced by reinvesting part of accumulated capital from high investment risk assets classes (e.g. equities) to low investment risk asset classes (government bonds, money market instruments) when the participant would be closer to the retirement age. The participant would not to make decision when to change pension fund and to which investment strategy (and investment risk) to switch and pension accumulation company would make instead of the participant (see Bodie *et al*, 1992; Benzoni *et al*, 2007; Gomez *at al* 2008).

In Lithuania by the law, pension accumulation company is obliged to propose to the participant to switch to conservative pension fund when 7 years left until his/her retirement age. Taking into account the fact that part of the pension funds participants have low financial literacy knowledge (LR

Vertybinių popierių komisija, 2009-2010; Rudolph & Žvinienė, 2009) or are passive in making decisions on personal finance management (Jurevičienė & Gausienė, 2010; Kindurys, 2011), only an offer to transfer the accumulated capital to the conservative pension fund might be not sufficient actions. Current defined contribution pension schemes' investment governance practice is unfortunately still often focused on the investment fund or fund choice offered in defined contributions scheme, rather than on the participants. Ideally, however, it would be possible to know much more about the customer besides their time horizon enabling more sophisticated matching on investment options to customers' needs: e.g. knowledge and skills, attitudinal/behavioural characteristics, observed behaviour; socio-demographic characteristics, etc (see Thorton & Fleming, 2011).

In conclusion, net investment return analysis of private second pillar pension funds has showed that private second pillar pension funds management in general shall be assessed as positive and effective. Especially taking into account, that during 2004-2012 years period financial markets face one the highest crisis during last century and the frustrations of asset classes values were very high. However, the periods with negative investment return were observed and it is more appropriate to high investment risk pension funds (pure equity pension funds group).

The Comparison of the Result

The analysis of accumulated amount in second pillar pension funds allows to compare this amount with the present value of reduction of earning-related parts of old age pension. The results are presented in the table 6. The accumulated amount in all pension funds' groups exceeds the evaluated present value of lost part of social insurance pensions for men, but is smaller for women. This difference is explained by longer life expectancy of women: in average they receive reduced social insurance old age pension during much longer than men, hence their expected loss is bigger, but the accumulated pension capital is the same as in the case of men. Moreover, the most successful was participation in pension funds investing small part into equities (lower investment risk pension funds).

The comparison of old-age pension in pay-as-you-go and annuities obtained from accumulated capital in fully funded systems is favourable for all groups of participants in all types of private pension funds. The different result than in the case of presented above comparison may be explained by unisex approach applied in the calculation of annuities. The loss of women is overridden by the gain of the men; as gain is bigger than loss (except pure equity pension funds, see table 6) then positive average result is obtained shows (see table 7). Despite the fact that annuity is calculated according to unisex approach it is still different for men and women because of different retirement age (in the tables it is assumed 63 years retirement age for men and 61 for women as a closest approach to the statutory age in the beginning of

2013). On the other hand, the basic annuity calculation rule approved by the Bank of Lithuania is only "criterial" rule. It just states the threshold of accumulated pension capital when it is required that participant must buy annuity (instead of taking lump sum). The basic annuities calculated according to the rule of Bank of Lithuania are not obligatory to insurance companies providing annuities. Table 8 compares basic and commercial annuities proposed in Lithuanian market for a person at age 62 years. The essential difference should be noticed: commercial annuities are smaller by around 25 percent; participant's loss in pay-as-you-go system is bigger than annuities proposed in the market. Increasing longevity, globalized competition and market fluidity have created a new landscape for the development of retirement products. According to Lithuanian law the participant of second pillar is obliged to buy annuity if its "basic" amount exceeds 50 percent of basic pension. In order to apply this rule, the Bank of Lithuania at least once per year approves the values of "basic" annuities. Each country shall determine a desired level of annuitization to ensure not only that pensioners do not suffer from abject poverty in old age, but also that pensioners maintain a reasonable standard of living in retirement compared with preretirement levels of consumption (Rocha, Vittas & Rudolph, 2011).

Table 6. *Gain or loss of average wage participant of second pillar pension funds in LTL*

Pension fund group	Accumu-lated amount in 2nd pillar	Reduction of earning-related part of old-age 1st pillar pension (evaluated present value)		Gain / loss (-) if person has participated in 2nd pillar pension system	
		Man	Woman	Man	Woman
Conservative	7587	5660	8427	1927	-840
Small part into equities	7998	5660	8427	2338	-429
Medium part into equities	7421	5660	8427	1761	-1006
Pure equity	6320	5660	8427	660	-2107

Table 7. *Annuity gain / loss for different genders of average wage participant (n second pillar pension funds in LTL per month*

Pension fund group	Accumu-lated amount	Basic annuity per month		Gain / loss compared to 31.80 LTL	
		M (63)	W (61)	M (63)	W (61)
Conservative	7587	44.03	41.63	12.23	9.83
Small part into equities	7998	46.41	43.88	14.61	12.08
Medium part into equities	7421	43.06	40.72	11.26	8.92
Pure equity	6320	36.67	34.67	4.87	2.87

Table 8. *Comparison of basic and commercial annuities (case of pure equity pension funds) for a 62 years old person at in LTL*

Accumulated amount	Basic annuity	Commercial annuity
6320	35.64	27.00

The evaluations presented in the article do not allow to state definitely that participation in second pillar pension funds during the years 2004-2012 was successful or unsuccessful from the point of view of retirement income of participants. The differences of income of participants and non-participants are not big enough to draw definite conclusion.

Conclusions

The comparison of a gain (additionally accumulated in private fully funded second pension pillar) and loss (reduced in pay-as-you-go first pension pillar) might serve as a criterion was participation successful or not. Although during analysed 2004-2012 years period in some intervals investment performance of second pillar pension funds was negative, pension funds investment management in general shall be assessed as positive and effective, especially taking into account that during analysed period financial markets faced one of the highest crisis during last century and the frustrations of asset classes values were very high.

The periods with negative investment return were observed in all groups of pension funds, but they are more appropriate to high investment risk pension funds (pure equity pension funds group). The comparison of accumulated pension capital amounts in private fully funded second pillar with losses in pay-as-you-go first pillar showed, that an average wage earner's accumulated amount in all fully funded private second pillar pension funds' groups exceeds the evaluated present value of lost part of social insurance pensions for men, but it is lower for women. This difference is explained by longer life expectancy of women: in average they receive reduced social insurance old age pension during much longer time than men, hence their expected loss is bigger, but the accumulated pension capital is the same as in case of men. The comparison of so-called "basic" annuity payout from accumulated amount with losses in pay-as-you-go system is favourable for all groups of participants in all types of pension funds at least at the beginning of payment period. The different result than in the case of previous comparison may be explained by unisex approach applied in the calculation of annuities.

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