

## SUSTAINABILITY OF THE PUBLIC FINANCE SYSTEM VIA OPTIMIZATION OF STRATEGIC MANAGEMENT

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**Abstract.** Driven by sustainability and knowledge-based principles, the public policy at all levels requires innovative ways of strategic management, which in many countries, particularly those that are trying to catch up to better-developed economies, is still chaotic and unstable. Having the theoretical background of innovative development of public finances and the concept of sustainability in finances revealed in the first chapters of the present publication, it continues with the overview of the pension system in Lithuania. Finally, the theoretical aspects of the pension reform in Lithuania, through proposed precise quantitative methods of valuating reform, are supported. The aim of the present article is to propose the model of optimizing the strategic management of the public finance system via calculating the contributions from the income that changes wages and salaries, modifications in strategies for the investment of accumulated funds in pension funds as well as the increase in the level of pension contributions.

**JEL classification:** A10, E62, H55.

**Keywords:** sustainability, public finances, pensions systems.

**Reikšminiai žodžiai:** tvarumas, viešieji finansai, pensijų sistemos.

### 1. Introduction

As is witnessed in the strategy of the EU 2020,<sup>1</sup> sustainability could be understood as continuous and simultaneous efforts and actions in a set of fields, while potential synergies are also an important point of sustainability. Thus, it is impossible to reach

<sup>1</sup> European Commission. Europe 2020. [accessed 2011-06-17]. <[http://ec.europa.eu/europe2020/index\\_en.htm](http://ec.europa.eu/europe2020/index_en.htm)>.

significant improvements in social policy of the state without touching such aspects as innovations, education, electronic society, climate change, energy and mobility, competitiveness, competences and employment, as well as the fight against poverty. Existing pension systems in some EU countries are more impoverishing than value-adding. Lithuania, with its current pensions system (which is described further in the article) and its future outlook, are the basic objects of our investigation. Lithuania supported the Euro-Plus Pact<sup>2</sup>, which delegated the responsibility to strengthen the monitoring system of economies to bring back the pre-crisis economic indicators.

Countries that accepted the project initiated in Berlin tend to increase inflows from ecological and financial operations, to stabilize the demographic situation and to increase the pension age. However, these emerging countries only start applying the principle of sustainability of public finances. On the other hand, the challenging public debt, the “brain drain” issues and, in some cases, the incapability to attract foreign direct investments, offset possible returns from any reform. It is reminiscent of a vicious circle, where the only way to solve the problem is a continuous and sustainable execution of all the policies by focusing on long-term targets. The lack of expertise regarding sustainability in such countries as Lithuania is even more pronounced in public finances. As is stated in the Sustainability Report (European Communities, 2009), the concept of the sustainability of public finances relates to the ability of a government to assume the financial burden of its debt currently and going forwards. In simple words, this considers the ability of the government to meet costs of its debt through future revenues. The inter-temporal budget constraint is satisfied if the projected outflows of the government are covered by the discounted value of all future government revenues. The inter-temporal budget constraints are most often considered over an infinite horizon with no implications about when the primary surpluses should be larger or smaller, and not what balance of expenditure and receipts they should be driven by; nor does it imply that the debt should stand at a particular finite value at any given point in time. Alternatively a finite version of the budget constraint can be defined, by setting a target date and a target debt level and considering whether and how this can be achieved. Sustainability could be assessed using current levels of gross government debt, the primary balance in structural terms (*i.e.* the cyclically-adjusted primary balance and removing one-off transactions) and expected additional costs arising from ageing. (European Communities, 2009).

The complexity of sustainability within public finances points at the importance of good management of time, risk and funds as well as at the necessity to grow revenues from high value-added and innovations, knowledge and technology-intensive activities or actions in the longer run. This is achievable via synergies of simultaneous execution of different policies, stronger cooperation among various-size, level and sector organizations, not forgetting the principles of solidarity, subsidiarity, proportionality or the “Europe of the citizen.”

“The stabilization of public pension spending can be also attained by means of reducing future generosity of pension benefits. The decline in the public pension benefit

<sup>2</sup> European Council. The Euro-Plus Pact. [accessed 2011-06-17]. <[http://www.consilium.europe.eu/uedocs/cms\\_data/docs/pressdata/en/ec/120296.pdf](http://www.consilium.europe.eu/uedocs/cms_data/docs/pressdata/en/ec/120296.pdf)>.

ratio over the period from 2008 to 2060 is substantial, over 20% in 11 Member States. It is very difficult to assess to what extent future pension benefits will be adequate in the future. The risk of too small pension must not be overstated by focusing on the drop in the benefit ratio.” (European Commission Directorate-General for Economic and Financial Affairs and the Economic Policy Committee Ageing Working Group, 2011)

Given the expected EU’s old-age dependency ratio of 54% in 2060, the EU could develop from having four working-age people for every person aged 65+ to a ratio of two to one. The rising longevity and low fertility, as well as emigration, aggravate the Lithuanian demographic situation. According to such a scenario, the forecasted 2060 old-age dependency ratio reads 66%, compared to 23% in 2008.

The job crisis is the second important factor endangering the fiscal sustainable development of the EU’s states, where the unemployment rate rose from 8% in 2006 to 10% in 2010. These figures are particularly demanding in the countries of Central and Eastern Europe, mainly due to a disrupted working career, triggered by transformation of the market economy. In addition to the job crisis and old-age dependency ratio, the fiscal crisis emerges via heavy public spending, the increase of government deficit from -1.4% of GDP in 2006 to -6.8% of GDP in 2009. Having a relatively young market, economies of CEE countries failed to benefit from the period of economic growth and experienced political and democratic instability, which led to a dramatic increase in government deficit.

## 2. Pension system in Lithuania: status quo

One of the principal deficiencies of the current Lithuanian old-age retirement system is its dependence upon the cyclical fluctuations in the economy. The global economic crisis, which started in 2007, equally affected all national economies and exposed their most ailing social issues. For once they are declining birth rate, unemployment, increase in emigration and the ageing population. On the other hand, the State encountered significant difficulties in its pursuit to ensure financial safety for retirees and an adequate income in old age. The overall economic downturn and the growing deficit of the State’s Social Insurance Fund Board (SODRA) only highlighted the inherent systemic faults of the Lithuanian State’s social insurance pension system. In 2010, the average annual number of old-age pension recipients accounted for nearly 600,00, and the average old age pension was as little as LTL 743.3 (Table 1).

**Table 1.** Lithuanian social development indicators

	2005	2008	2009	2010	2011
The average annual number of inhabitants, thousands.	3414.3	3358.1	3339.4	3286.8	3222.0
The unemployment rate, %	8.3	5.8	13.7	17.8	15.4
The average net salary in the economy, Lt	916.7	1650.9	1602.0	1553.8	1591.8

	2005	2008	2009	2010	2011
The average pension provided by the public social insurance system, Lt	420.3	769.7	811.1	746.3	748.38
The average number of pensioners in the country, thousands.	595.5	595.0	597.9	598.8	600.2

Source: compiled by authors, based on the data provided by Statistics Lithuania

The pension policy has found itself in a particularly challenging situation—the prevailing deficit of funds in the State social insurance fund, negative population growth ratio, an increase in the number of older-aged people relative to working-age population—and the entirety of factors weakening the State's social insurance system being hardly indicative of any positive movements for future pension recipients. This insufficient funding and the ageing of the population have been undoubtedly affecting the pay-as-you-go pension system which remains predominant in the longer perspective. This inevitably brings about the need to initiate a reform of the State social insurance pension system.

In the period from 2002 to 2009, the revenue of SODRA increased from LTL 4.57 bn. to LTL 11.357 bn., while its expenditures—from LTL 4.461 to 14.236 bn. It should be noted that the annual growth rates in respect of both the income and the expenditures until the year 2008 were comparable. The least increase was recorded in 2003, when the revenues grew by 6.91 %, and the expenditures—by 5.42 %. The most prominent increase in the revenues was recorded in 2007—by 25.12%, and in respect of the expenditures—in 2008, when the growth in expenditures by large exceeded the increase of revenues, respectively, by 36.31% and 14.94%. It was specifically that year when the budget surplus turned into a deficit budget. The deficiency of the funds in that year accounted for LTL 1.437 bn., and then doubled in 2009, when the deficit reached LTL 2.879 bn. In the year of the surplus State social insurance budget a reserve was formed of LTL 1.46 bn. that was subsequently used to cover the deficit of 2008 (Table 2).<sup>3</sup>

**Table 2.** The budget of the State Social Insurance Fund Board

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Income (mln. Lt)</b>	4570	4886	5564	6391	7800	9759	11217	11357	10487	11262
<b>Growth of income, compared to previous years (%)</b>		6.91	13.9	14.9	22.1	25.1	14.94	1.25	-7.7	7.4
<b>Expenses (mln. Lt)</b>	4461	4703	5326	6130	7245	9283	12654	14236	13268	12989
<b>Expenses growth, compared to previous years (%)</b>		5.42	13.3	15.1	18.2	28.1	36.31	12.50	-6.8	-2.1

<sup>3</sup> Ministry of Social Security and Labour. Social report 2008-2009. [accessed 2011-06-17]. <<http://www.socmin.lt/index.php?132610553>>.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Surplus/deficit (mln. Lt)</b>	109	183	238	261	555	476	-1437	-2879	-2781	-1727
<b>Expenses for pensions (mln. Lt)</b>	3325	3528	3845	4336	4865	6103	7980	8262	7660	7667
<b>Remittance to pension funds (mln. Lt)</b>	0	0	173	308	531	852	1064	434	328	381
<b>General expenses for pensions (mln. Lt)</b>	3325	3528	4018	4644	5396	6955	9044	8696	7988	8048
<b>Growth of general expenses for pensions, compared to previous years (%)</b>		6.11	13.9	15.6	16.2	28.9	30.04	-3.85	-8.14	0.75

Source: compiled by authors, based on State social insurance fund board under the Ministry of Social Security and Labour. Lithuania: Figures and Facts 2002-2010. [accessed 2011-06-17]. <<http://www.sodra.lt/get.php?f.21997>>.

With the national economy in recession the unemployment rates were soaring, as well as the volumes of unemployment benefits that in 2008 accounted for LTL 306 mln, and reached LTL 629 mln in 2009. Furthermore, the already increased deficit was adversely affected by the decreased revenues due to the dramatically decreased number of the insured people as well as decreasing their average wages.

The Lithuanian social insurance and pension systems are overly complex encompassing pension benefits, also the administration of the resources of the State social insurance fund, the State budget, as well as the pension accumulation system. A long-term sustainability of the social insurance and pension systems, adequacy of benefits, transparency of their administration are the tasks and objectives of primary importance at the State level.

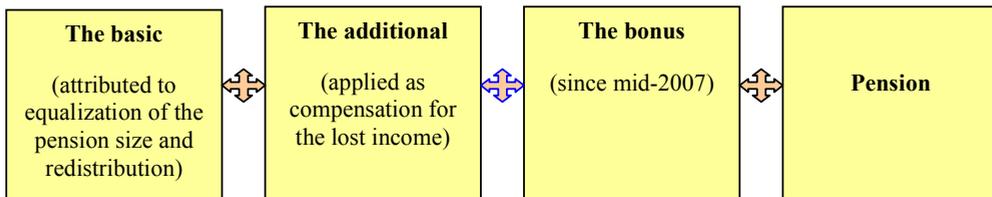
The old age pension provided by the State social insurance system is considered one of the most important parts of social security in old age. The old age social insurance is the largest component of the pension system and will, in the long term, remain the principal source of retirement income for a large majority of Lithuanian residents. According to the Law on State Social Insurance Pensions until 1 January 2012 the old-age retirement age for men is 62 years and 6 months, and 60 years for women, and starting from 2012, the age entitling to old-age pension for both men and women is 65 years. The old-age pension is granted to persons meeting the following conditions: 1) the person is a permanent resident of the Republic of Lithuania; 2) the person attains the old-age retirement age; 3) the person has a minimum 15 years' record of State social pension insurance. Currently the old age pension in Lithuania consists of two parts and the bonus:

**Basic part**—is equal in respect of all persons that have the mandatory record of social pension insurance and is equal to 110% of the basic social insurance pension; the

pension shall be proportionally reduced for persons that do not have the mandatory length of record; this pension guarantees the minimum pension provision. The amount of the basic State social insurance pension is approved by the Government on the motion of the State social insurance fund Board having regard to the economic capacities and the level of inflation of the State. The basic State social insurance pension currently is LTL 360, and within the past 13 years it increased by LTL 285.

**Additional part**—proportionate to pension insurance contributions paid by the person and provides the additional pension provision to persons having regard to the length of the insurance period and the insured income that the person concerned had during the insurance period. With a view to avoiding the significant and unjustifiable social differentiation Lithuanian Parliament had approved the coefficient of the person's insured income (i.e., the wages relative to the average income in Lithuania)—K€5. The insured income of a current year is calculated according to the methodology approved by the SSIF Board, having regard to the revenues and expenditures of the SSIF Board of the respective year and the respective period of the year.

**Bonus for the length of service** (the amount of a State social insurance old-age pension bonus for the length of the record shall be calculated by multiplying 3% of the State social insurance basic pension by the sum of every full year of the State social pension insurance record in excess of 30 years).



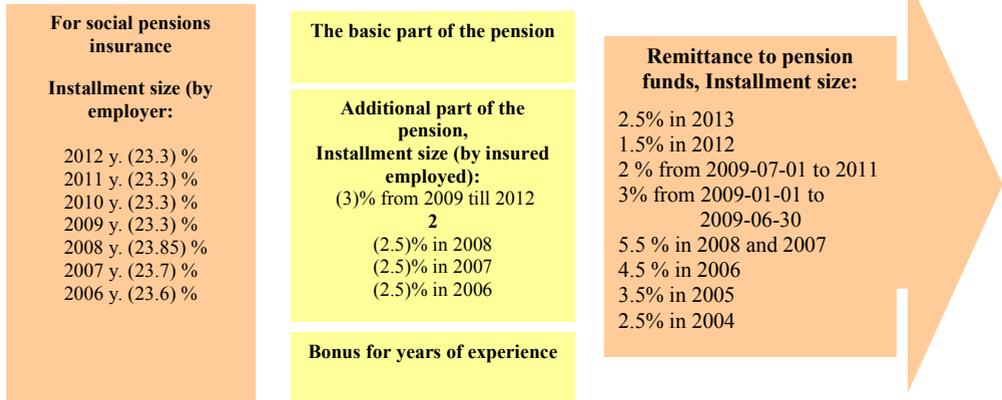
**Fig. 1.** *The structure of the social insurance pension*

*Source: compiled by authors*

Starting from 2003, an accumulation-based pension system as complementary to the current old-age pension system was launched in Lithuania. The procedure for the partial privatization of the State social insurance pension system in Lithuania was established by the Law on Reform of the Pension System of 3 December 2002 that came into force on 1 January 2003. The Law provided that next to the social insurance pension system that was referred to as the 1<sup>st</sup> pillar, and partly replacing it the system of private pensions shall be put in place and referred to as the 2<sup>nd</sup> pillar system to be financed from the funds accumulated within the 1<sup>st</sup> pillar system (Lazutka, 2008).

Furthermore, every person is entitled to participate in the 3<sup>rd</sup> pillar of the pension system where the contributions to pension funds shall be paid from one's personal resources. Participation in the 3<sup>rd</sup> pillar pension system is supported by the State by providing tax relieves. Where a person, according to the Law on Reform of the Pension System chooses to participate in the pension accumulation system part of his contribu-

tions to the State social insurance pension system is transferred to a private pension fund at his selection. In this relation when computing his old-age pension the person's annual coefficient of his insured income shall be accordingly reduced in respect of the years of his participation in the pension accumulation system. Thus the additional part of the old age pension of such person will be accordingly reduced.



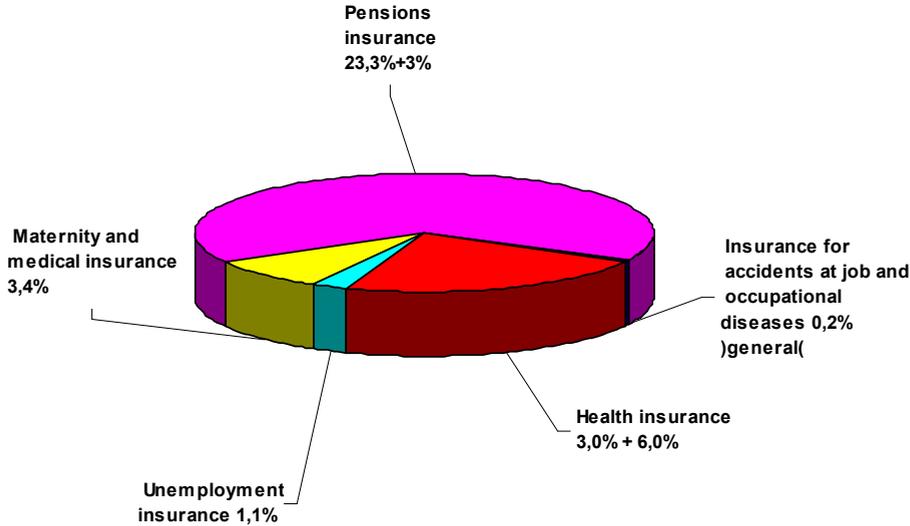
**Fig. 2.** The Spread of Public Social Insurance Instalments

*Source: compiled by authors, based on Law of the Pension System Reform of the Republic of Lithuania 2002 December 3<sup>rd</sup>. No. IX-1215 and the data of the State Social Insurance Fund Board, 2012*

Seimas (The Lithuanian Parliament) in 2012 approved Social Insurance budget and new tariffs of remittances to pension funds for 2012 and 2013 years. For the future years (after 2012) Seimas are going to decide at the end of Spring 2012 session evaluating all Projects devoted to changes in financing of Lithuanian pension system and submitted by Lithuanian Government.

Thus the pension system consisting of three pillars has been put in place and made operational in Lithuania. The first pillar is represented by the "SODRA" pension that has the longest record of operation. All permanent residents of Lithuania working according to the employment contracts, whether on the basis of membership or individually are obliged to acquire the social insurance coverage. Such persons are entitled to social insurance old-age, disability and the survivor's (loss of breadwinner) pensions. However, some groups of self-employed persons, namely, farmers, sportsmen or the ones working on the basis of copyright employment contracts are not insured on the mandatory basis. Certain groups of persons, namely, persons taking care of children up to three years of age or other dependent members of the family, also servicemen in the mandatory military service are insured for the State social insurance basic pension only. The contribution to the State social insurance fund on the part of an employee is 9% of his salary, and the employer's contribution is 31%. Having collected the contributions "SODRA" redistributes the funds to current pensioners.

Covered in the mandatory manner by the State social insurance shall be all insured (taxpayers) of working age at public institutions or private entities and organizations from the first day of their employment. The major part of social insurance contributions is allocated to fund the current pension benefits (see Fig. 3).



**Fig. 3.** The spread of the Public Social Insurance Instalments tariffs, based on various insurance types 2010 y. 31.0 % + 9% = the part of insurer + the part of insured.

*Source: compiled by authors, based on the data of the State Social Insurance Fund Board, 2012*

As of 1 January 2010, the Provisional Law on the Recalculation and Payment of Social Benefits of the Republic of Lithuania that came into force on 31 December 2011. The Law is applied to social insurance old-age pensions in excess of LTL 650, social insurance orphan's pensions exceeding LTL 325, and survivor's pension. Within the period of the validity of the Law social insurance pensions shall be recalculated by increasing the basic part of the pension up to 120% of the State social insurance basic pension and applying the insured income amount of LTL 1,170 approved for the current year for the purpose of the application of the Provisional Law. Old-age pension that does not exceed the threshold social insurance pension (LTL 650) shall not be recalculated. Where following the recalculation the pension falls below the established limit the person shall be paid a compensatory bonus equal to the difference between the limit amount and the recalculated pension amount (State).

Second pillar pension is funded by way of funds accumulation. Second pillar pension is administered by private pension funds, insurance companies and other financial institutions. Companies of two types are involved in the pension accumulation activities—management companies of pension funds and life insurance companies whose activities are being supervised by the Securities Commission and the Insurance Supervisory Commission of the Republic of Lithuania (from 2012 the supervision sys-

tem is transferring into one entity and related supervision functions of all financial sector—banks, insurance companies, pensions funds, intermediaries—will be provided by Central Bank of Lithuania). Part of the contributions to the State social insurance pension system is channelled to personal pension accounts of employees. Such contributions are accumulated and invested in pension funds. The “SODRA” contributions are transferred according to the established rates (Figure 2) and the related accrued amounts.

Each citizen takes his discretionary decision whether to participate in the 1<sup>st</sup> pillar pension system and become a beneficiary of the 1<sup>st</sup> pillar pension provision only, or opt for the mixed arrangement of the 1<sup>st</sup> and the 2<sup>nd</sup> pillar pension provision and receive the pension composed of two parts. Upon opting for pension accumulation the amount of the contributions or the payment principle does not change.

Third pillar provides additional long-term accumulation of pension. This pillar encompasses the individual pension insurance, life insurance schemes and other alternative saving methods. The system is open for participation to all willing as its participants shall independently pay contributions according to signed agreements and following the procedure agreed therein. The Lithuanian pension privatization model is similar to the reforms earlier implemented by other States apart from one material difference—Lithuania does not impose a mandatory transfer to private pension funds in respect of any age group of residents, or any restrictions to participate in the reform.<sup>4</sup>

In view of the difficult economic situation in 2009 and 2010, the share of the accumulative contribution transferable to pension funds was temporarily reduced to 2% of the personal insured income. In 2011, the Seimas of the RL decided that the transfers to private pension funds will not yet be restored to their previous level (5.5% of personal insured income), i.e., as has been established earlier. Currently, the development of the principal guidelines for the forthcoming pension reform is in progress. The new guidelines will involve the changes in terms of the pensionable age and the share of the contributions allocated to private pension accumulation, as well as new options for the current financing system.

At its meeting of 20 June 2011, the Government in principle agreed on the concept of pension accumulation in private funds beyond 2013. As Donatas Jankauskas, Minister of Social Security and Labor explained, an agreement had been reached that in relation to the accumulation of the so-called 2<sup>nd</sup> pillar pension, it would be composed of three parts—one part of the pension would be transferred from the social insurance system (2% of the contributions), a share of it shall be paid by the person himself and the State would make an established-rate contribution. The latter two parts, according to the Minister, will not necessarily be equal.

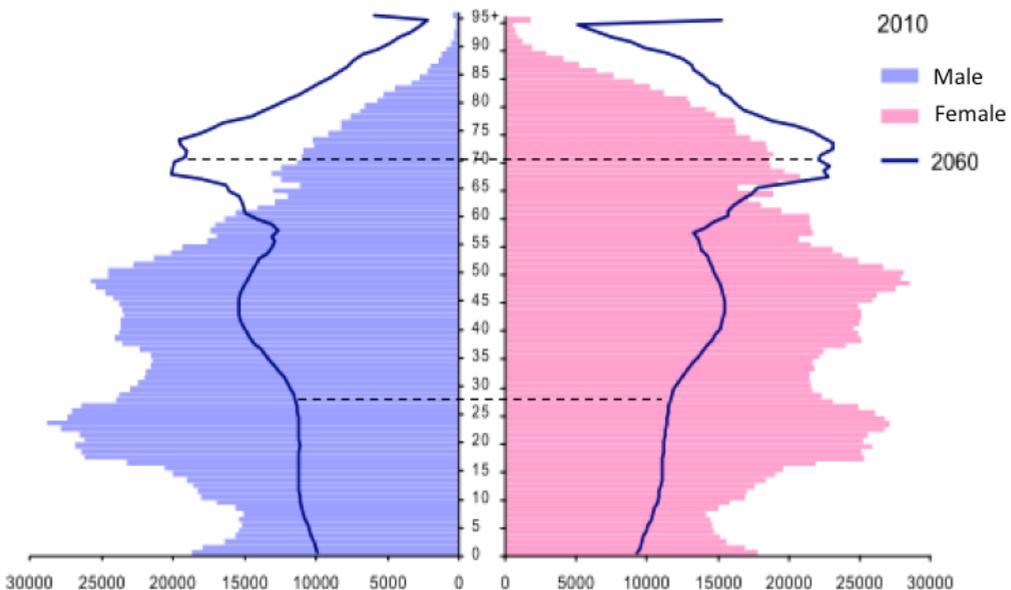
The current Lithuanian pension system is to a large extent based on the traditional redistribution and the principle of solidarity between generations (PAYG).

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<sup>4</sup> European Commission . Joint Report on Pensions. Progress and key challenges in the delivery of adequate and sustainable pensions in Europe. Country profile. [accessed 2011-06-17]. <[http://ec.europa.eu/economy\\_finance/publications/occasional\\_paper/2010/pdf/ocp71\\_country\\_profiles\\_en.pdf](http://ec.europa.eu/economy_finance/publications/occasional_paper/2010/pdf/ocp71_country_profiles_en.pdf)>

However, the system clearly has one material shortcoming—ignoring and distortion of motivation. Most working people in Lithuania feel very insecure concerning their pension in the future; in the apprehension that for each additional Litas paid as a social contribution they will in the future be receiving a proportionally smaller pension return. Therefore, as an observable trend already, when having a choice to pay or not to pay, conceal or not to conceal social insurance contributions the insured opts for paying the lowest possible social insurance contributions, i.e., they do not feel motivated. All pensioners that have the required record of service are paid an equal amount basic pension. Thus the basic pension serves as a vehicle for redistribution from those who earn more to those whose income is lower. Furthermore, the pension amount is specifically dependent upon the financial possibilities of the State, and political decisions. This situation creates significant uncertainty and unpredictability concerning the amount of pension in the future. The State has the right, at any time, to adjust the formula for the calculation of the additional part of the pension. The principal (or the basic) share of the pension is to an even larger extent dependent upon political decisions of the State. Hence another problem related to motivation and economic efficiency is the lack of clear criteria and methodology as to the procedure for determination of the basic pension amount that is established by the Government.

One of the principal types of risks related to the social insurance system is old age. By 2060 the age distribution will be shaped almost like reversed pyramid, with the oldest age classes bigger than the youngest ones (Figure 4).



**Figure 4.** Age and sex pyramid. Lithuania 2010 and 2060

*Source: Statistic Lithuania, 2012; Eurostat, 2011*

Many pension systems, and specifically in Europe, have historically developed to a large extent mixed social protection models that combine the guaranteed minimal (basic) pensions and the additional income-linked part of the pension that depends on the amount of the social insurance contributions paid during the person's working age, the length of service, etc. Therefore within the modern social security systems the classification offered by the founders of social protection models (O. Von Bismarck, Beveridge, etc.) has been gradually losing its relevance, with the focus being increasingly placed upon the ratio of the guaranteed basic pension and the additional income-linked pension (Gudaitis, 2009).

In the opinion of the authors of the present paper, the amount of the old-age pension should first and foremost be directly dependent upon the amount paid for social insurance, and the period of the payment of the State social insurance pension contributions. Second, the insured should be able to continuously monitor the amount of the accumulated contributions and the change of the pension amount for a respective year. This would promote confidence and trust, on the part of the public, in the State social insurance system; encourage legal work and payment of contributions to pension insurance system, and finally, an indexation coefficient should be established to adjust the pension amount having regard to the changes in the process of goods and services, movements in service prices, inflation rates and other indicators.

However, when considering the possibilities for reforming of the current pension system, it should be heavily taken into consideration that social insurance system must be fair also from the actuarial viewpoint—a life-time's contributions must be reasonably proportional to expected benefits. Furthermore, the system should be constructed clearly and transparently and be resistant to any political attempts to be manipulated in pursuit of short-lived political objectives. From a financial viewpoint, the pension system should be able to flexibly and without individual intervention from political forces to respond to economic and demographic challenges (low birth rates, longer life expectancy, and extensive emigration). Third, the system should be designed to prevent any distortions of the labour market, i.e., the system should not encourage retiring people of working capacity and willing to work immediately after they reach the established minimum pension age.

The new pension model should build a closer link between the contributions and benefits ensuring adequate pensions, and, at the same time, able to maintain the financial sustainability of the entire system. Any pension system undergoing reformation can ensure adequate pensions to residents only provided the systems are financially sustainable and well-adjusted to the ever changing public context; if that fails, and the pension system is not able to ensure income adequate for pensioners to live in dignity, the system will incur additional costs, e.g., higher expenses for social support. Therefore, the guiding objective in relation to the pension system reform being implemented, is to seek financial sustainability and ensure adequate income for pension age residents. The adequate and sustainable pensions for all are feasible only provided they are well adjusted to the changing needs of the society.

The renowned architect of the Chilean pension reform Jose Pinera has stated that the pay-as-you-go pension system has a fundamental flaw; it destroys the essential link between effort and reward, between personal responsibilities and personal rights, which can result in the disaster. (Pinera, 1996)

### 3. Methods of Valuating Long-Term Trends in the Lithuanian Pension System and Sustainability of Lithuanian Public Finances

The Lithuanian State's social security system has manifested significant systemic deficiencies that, in view of the recent economic recession, have become even more specifically apparent. In the long-term perspective, with the elderly population growing and a dramatically decreasing numbers of taxpayers, it is becoming increasingly difficult to ensure a reasonable income level for old-age people, or for those in view of certain insurance events. This casts significant uncertainty as to the sustainability of the current public finance system.

For the purpose of defining the sustainability of public finances the European Commission Directorate-General for Economics and Financial Affairs of the European Commission (2009) has offered an indicator which is expressed by the formula:

$$D_{t_0} - \sum_{t=t_0+1}^{\infty} \frac{PB_t}{(1+r)^{t-t_0}} = 0, \quad (1)$$

where:

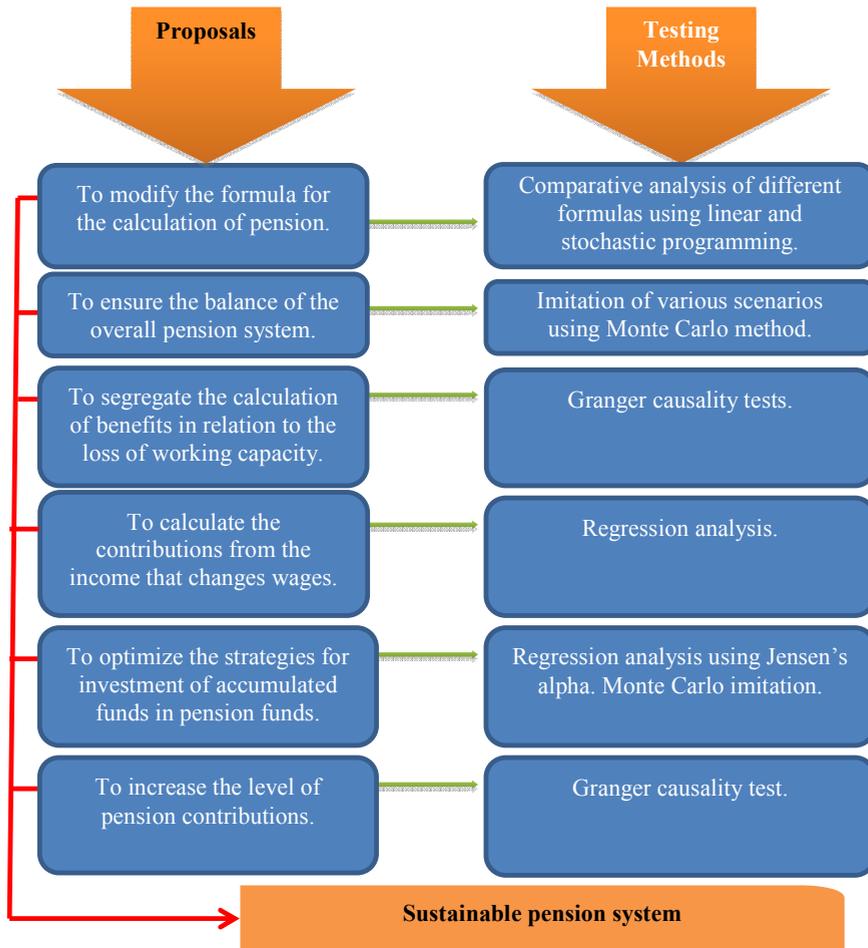
$D_{t_0}$  – gross debt as a share of GDP in the long-term,

$PB_t$  – balance of the public sector in period  $t$ ,

$r$  – Differential between the nominal interest rate and the nominal GP growth rate.

For the purpose of methodology, the indicator shall be used for the assessment of sustainability of the Lithuanian public finances. Other methods used to survey the impact of the long-term development trends in the Lithuanian pension system and the projected systemic changes upon the sustainability of the Lithuanian public finances will include the digital and sensitivity analysis in combination with the assessment of direct and indirect factors. Also, the methodology offered shall be used for the assessment of the impact of the pension system reform upon the sustainability of public finances in Bulgaria, Denmark, Estonia, Finland and Sweden.

The Government of the Republic of Lithuania has offered a package of proposals with a purpose to solve social security problems. However, the suitability of these proposals must be tested. We propose to use the testing methods which are described below (Figure 5).



**Fig. 5.** Testing methods of proposals with a purpose to solve social security problems

*Source: compiled by authors*

**One of the proposals** was to calculate the contributions also from the income that changes wages and salaries, i.e., social security benefits and allowances (illness, maternity leave, paternity leave, unemployment levels, etc.) that are still treated as personal insured income and grants the right to receive pension benefits. The method of proposals' assessment includes the assessment of the pension system revenues. The sought assessment of the impact of the measures proposed upon the level of income of residents and the domestic consumption level will in the first place assess the possible additional contribution revenues of the pension system where the insurance contributions are computed also from benefits and welfare allowances. The method will also assess the impact of the proposal upon the level of resident income, domestic consumption, and financial sustainability. The impact shall be assessed by applying the regressive modeling that will allow the determination of sensitivity coefficients. Given the knowledge

that domestic consumption as well as the gross domestic product are sensitive to the changes of resident income it will be possible to assess the consequences of the taxation of welfare benefits upon the national economy.

Additionally, **the Government has offered** to optimize the strategies for the investment of accumulated funds in pension funds depending on the age of the participant in the accumulation system, and link the deductions to the pension fund managers to the efficiency of asset management, and ensure a more efficient regulation of the acquisition of accumulative pensions, as well as the spectrum of benefits under the 2<sup>nd</sup> pillar pension accumulation system. The proposal can be assessed using the survey which will help to identify the most successful investment strategies pursued by pension funds. A successful strategy shall be one that will yield returns above the market levels. For the purpose of identification, the Jensen method can be employed.

In respect of each individual fund a regression should be designed using the time series data.

$$R_{jt} - R_{ft} = \alpha_j + \beta_j (R_m - R_{ft}) + u_{jt}, \quad (2)$$

where:

$R_{jt}$  – portfolio return at time  $t$ ,

$R_{ft}$  – return of risk-free securities (e.g., 1 year maturity T-bills),

$u_{jt}$  – error,

$\alpha_j$  and  $\beta_j$  – values to be identified.

The principal criteria that needs to be identified is the materiality of  $\alpha_j$ , since it is specifically this criterion that determines whether or not the return of the fund exceeds the market index return.  $H_0: \alpha_j = 0$ . This coefficient is the Jensen alpha. The method makes it possible to determine the funds that generate the largest return in relation to the average market return (excluding the exceptional cases, i.e., the funds whose results are specifically different from the average return). Upon the identification of the most successful funds the method will include the survey of the practices employed thereby for the purpose of the management of pension funds. The practice will be compared with the practice prevailing and employed by funds operating in Lithuania. The performance of pension funds operating in Lithuania can be determined using the Monte Carlo imitation modelling method.

For the purpose of avoiding the duplication of benefits **the last proposal** was to integrate the State pensions into the overall social security and accumulation pension system by increasing the level of pension contributions. In order to assess the possible outcomes of the proposal it is first necessary to consider the possible changes in the population receiving State pensions. By applying the Granger causality tests it is first necessary to assess whether or not the changes are caused by the amount of the State security pension and the rates of the social security contributions; where the amount of the State pension and contribution rates may have a significant impact upon the selection of profession then the regression model will allow a quantitative assessment

of changes in the numbers of persons receiving State pension by increasing pension contributions by a respective percentage amount. These are only a few examples demonstrating how it could be possible to methodologically test the governmental proposals in solving social security problems. Applying a set of various testing methods is a prerequisite for starting measuring the progress of sustainability in public finances.

#### **4. Conclusions**

The complexity of sustainability within public finances points at the importance of good management of time, risk and funds as well as at the necessity to grow revenues from high value-added and innovations, knowledge and technology-intensive activities or actions in the longer run.

The current Lithuanian pension system is mainly based on the traditional redistribution and the principle of solidarity between generations: serves as a vehicle for redistribution from those who earn more to those whose income is lower. The pension amount is specifically dependent upon the financial possibilities of the State, and political decisions. Another problem is related to motivation and economic efficiency that could be identified as the lack of clear criteria and methodology as well as the procedure for determination of the basic pension amount.

It is recommended to transform the system into one where the amount of the old-age pension should be directly dependent on the amount paid for social insurance and the period of the payment of the State social insurance pension contributions. The insured should be able to continuously monitor the amount of the accumulated contributions and the change of the pension amount for a respective year. It should be focused on encouraging legal work and payment of contributions to the pension insurance system, while an indexation coefficient should be established to adjust the pension amount regarding changes in the process of goods and services, movements in service prices, inflation rates and other indicators. A life-time's contributions must be reasonably proportional to expected benefits.

In term of management, the system should be constructed clearly and transparently. From a financial viewpoint the pension system should be able to flexibly and without individual intervention from political forces to respond to economic and demographic challenges (low birth rates, longer life expectancy, and extensive emigration). The system should be designed to prevent any distortions of the labour market, i.e., should not encourage the retirement of people of working capacity and willing to work immediately after they reach the established minimum pension age.

The new pension model should build a closer link between the contributions and benefits ensuring adequate pensions, and, at the same time, able to maintain the financial sustainability of the entire system. The adequate and sustainable pensions should be adjusted to the changing needs of the society. These are recommendations that should be carefully investigated and each proposal tested. Methodologically testing proposals by applying such methods as comparative analysis of different formulas using linear and stochastic programming, imitation of various scenarios using the Monte Carlo

method, Granger causality tests, Regression analysis and Jensen's alpha, are only the initial stage of further investigations that should be carried on at each stage of developing a sustainable and socially responsible public finances system.

## References

1. European Commission. Europe 2020. [accessed 2011-06-17]. <[http://ec.europa.eu/europe2020/index\\_en.htm](http://ec.europa.eu/europe2020/index_en.htm)>.
2. European Commission. Joint Report on Pensions. Progress and key challenges in the delivery of adequate and sustainable pensions in Europe. Country profile. [accessed 2011-06-17]. <[http://ec.europa.eu/economy\\_finance/publications/occasional\\_paper/2010/pdf/ocp71\\_country\\_profiles\\_en.pdf](http://ec.europa.eu/economy_finance/publications/occasional_paper/2010/pdf/ocp71_country_profiles_en.pdf)>.
3. European Commission Directorate-General for Economic and Financial Affairs and the Economic Policy Committee Ageing Working Group. 2011. The 2012 Ageing Report: Underlying Assumptions and Projection Methodologies. ISBN 978-92-79-19298-2.
4. European Communities. 2009. Sustainability Report – 2009. Luxembourg: Office for Official Publications of the European Communities. ISBN 978-92-79-11370-3.
5. European Council. The Euro-Plus Pact. [accessed 2012-02-17]. <[http://www.consilium.europa.eu/uedocs/cms\\_data/docs/pressdata/en/ec/120296.pdf](http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/120296.pdf)>.
6. Gudaitis, T. 2009. "Senatvės pensijų sistemos modelių teorinė analizė." *Organizacijų vadyba: sisteminiai tyrimai*, No.50, p. 53-68.
7. Lazutka, R.2008. "Lietuvos socialinio draudimo pensijų dalinio privatizavimo tikslai ir rezultatai." *Ekonomika*, No.82, p. 104-126.
8. Lietuvos Respublikos Valstybinių socialinio draudimo pensijų įstatymas 1994 m. liepos 18 d. Nr. I-549. [accessed 2011-06-17]. <[http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc\\_l?p\\_id=378767](http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=378767)>.
9. Lietuvos Respublikos Pensijų sistemos reformos įstatymą 2002 m. gruodžio 3 d. Nr. IX-1215. [accessed 2011-06-17]. <[http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc\\_l?p\\_id=378175](http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=378175)>.
10. Ministry of social security and labour. Social report 2008-2009. [accessed 2011-06-17]. <<http://www.socmin.lt/index.php?132610553>>.
11. Ministry of social security and labour. State social insurance system. [Accessed 2011-06-17]. URL: <<http://www.socmin.lt/index.php?1225275207>>.
12. Ministry of social security and labour. State social insurance pensions for old-age. [Accessed 2011-06-17]. <<http://www.socmin.lt/index.php?1127366606>>.
13. Pinera, J. 1996. "Empowering workers: the privatization of social security in Chile." *The Cato Journal: an Interdisciplinary Journal of Public Policy Analysis*. Volume 15, No. 2-3.
14. Socialinės apsaugos ir darbo ministerija. Valstybinių socialinio draudimo pensijų perskaičiavimas ir mokėjimas pagal Socialinių išmokų perskaičiavimo ir mokėjimo laikinąjį įstatymą. [accessed 2011-06-17]. <<http://www.socmin.lt/index.php?-850078155>>.
15. Statistics Lithuania. 2011. Lithuania in Figures. ISSN 1822-8941.
16. State social insurance fund board under the ministry of social security and labour. Lithuania: Figures and Facts 2006-2010. [accessed 2011-06-17]. <<http://www.sodra.lt/get.php?f.21997>>.
17. Valstybinio socialinio draudimo fondo valdyba. Skaičiai ir faktai: 2002-2006. [accessed 2011-06-17]. URL: <<http://www.sodra.lt/get.php?f.1703>>.
18. Valstybinio socialinio draudimo fondo valdyba. Skaičiai ir faktai: 2005-2009. [accessed 2011-06-17]. <<http://www.sodra.lt/get.php?f.12988>>.

## VIEŠŪJŲ FINANSŲ SISTEMOS TVARUMAS PER STRATEGINIO VALDYMO OPTIMIZAVIMĄ

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**Santrauka.** Skatinant tvarumą ir žiniomis grindžiamus principus, visų lygių viešosios politikos strateginis valdymas turi būti optimizuojamas pagal susiklosčiusią situaciją atitinkamoje šalyje. Šio straipsnio tikslas yra pasiūlyti modelį, kaip optimizuoti viešųjų finansų sistemos strateginį valdymą, apskaičiuojant įmokas nuo pajamų, atsižvelgus į darbo užmokestį, investicijų į pensijų fondus pokyčius, pensijų įmokų lygį. Kaip nurodyta Europos Bendrijos parengtoje tvarumo ataskaitoje (2009), viešųjų finansų tvarumo sąvoka yra susijusi su vyriausybės gebėjimu prisiimti valstybės skolos finansinę naštą šiuo metu ir ateityje. Taigi, tvarus viešųjų finansų strateginis valdymas turi gebėti aptarnauti valstybės skolos išlaidas per būsimas pajamas. Besivystančiose šalyse viešųjų finansų tvarumo principų taikymas yra apsunkinamas augančia valstybės skola, „protų nutekėjimo“ problema, augančiu nedarbu bei nesugebėjimu pritraukti tiesiogines užsienio investicijas. Tai primena užburtą ratą, kur vienintelis būdas išspręsti problemą yra tęstinis ir tvarus visų lygių viešosios politikos strateginis valdymas, sutelkiant dėmesį į ilgalaikius tikslus. Lietuvos atveju viešųjų finansų tvarumas yra apsunkinamas demografinės situacijos – ilgėja gyvenimo trukmė, mažėja gimstamumas bei didėja emigracijos srautai. Pagal tokį scenarijų prognozuojama, jog 2060 m. išlaikomo amžiaus (65 metų ir vyresnių) žmonių koeficientas išaugs nuo 23 % (2008 m.) iki 66 % (2060 m.).

Lietuvos pensijų politika atsidūrė ypač sudėtingoje situacijoje – Valstybinio socialinio draudimo fondo lėšų deficitas, neigiamas gyventojų prieaugis, didėjantis pensinio amžiaus žmonių skaičius, lyginant su darbingo amžiaus gyventojais, sudaro veiksmų visumą, silpninančią valstybinę socialinio draudimo sistemą. Lietuvos socialinio draudimo ir pensijų sistemos strateginis valdymas yra sudėtingas, apimantis pensijų išmokų, pensijų kaupimo, Valstybinio socialinio draudimo fondo bei Valstybės biudžeto išteklių valdymą. Susiklosčius dabartinei situacijai, Lietuvos socialinio draudimo ir pensijų sistemos strateginio valdymo prioritetiniai tikslai turėtų būti ilgalaikis finansų tvarumas, adekvačios socialinės išmokos bei skaidrus jų administravimas.

Dabartinė Lietuvos pensijų sistema remiasi tradiciniu persikirstymu ir solidarumo tarp kartų principais: lėšos persikirstomos iš tų, kurie uždirba daugiau, tiems, kurių pajamos yra mažesnės. Pensijos dydis priklauso nuo valstybės finansinių galimybių ir politinių sprendimų. Taigi, trūksta aiškių kriterijų ir metodikos, nustatant bazinį pensijos dydį. Todėl rekomenduojama transformuoti šią sistemą, kad senatvės pensijos dydis tiesiogiai priklausytų nuo sumokėtų socialinio draudimo įmokų ir mokėjimo laikotarpio. Apdraustajam turi būti suteikta galimybė nuolat stebėti sukauptų įmokų dydį ir senatvės pensijos sumą atitinkamiems metams, atsižvelgiant į kainų pokyčius, infliacijos dydį ir kitus indeksus. Taip turėtų būti skatinamos įmokos į pensijų draudimo sistemą, kadangi per visą gyvenimą sumokėtos įmokos bus pagrįstai proporcingos laukiamai naudai. Sistemos strateginis valdymas turi būti paremtas aiškumu ir skaidrumu. Finansiniu požiūriu pensijų sistema turi lanksčiai reaguoti į ekonomines ir demografines problemas be politinių jėgų įsikišimo. Sistema turėtų būti suprojektuota, siekiant išvengti bet kokių darbo rinkos iškraipymų. Naujasis pensijų sistemos modelis turėtų sukurti glaudesnę ryšį tarp įmokų ir išmokų, užtikrinant atitinkamą senatvės pensijos dydį, bei tuo pat metu išlaikant visos sistemos finansinį tvarumą, atitinkantį visuomenės poreikius. Pateiktos rekomendacijos turėtų būti kruopščiai ištirtos ir patikrintos. Rekomendacijų tinkamumo tikrinimas, taikant to-

kius metodus, kaip lyginamoji analizė, naudojant linijinį ir stochastinį programavimą, įvairių scenarijų imitacija, taikant Monte Karlo metodą, Grangerio priešastingumo testus, regresijos analizę bei Jenseno alfa, yra tik tolesnių tyrimų pradinis etapas.

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