Pension Reform in Russia and in the World: Implementation Prospects

Dmitry Pomazkin

Calculating Parameters of Russian Pension System

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Objective

- Analyze financial sustainability of pension system under contribution rate reduction

- Update the previous version of the model. Adjust demographic and macroeconomic projections.

- Calibrate primary data. Design a scheme to monitor financial flows. Develop quantitative estimations used to interface the primary data for linear projections.

- Run numerical estimations including scenario simulations and long-term forecasting.

- Assess parameters of the pension system and solvency of the PAYG system.

Methodology of Calculations
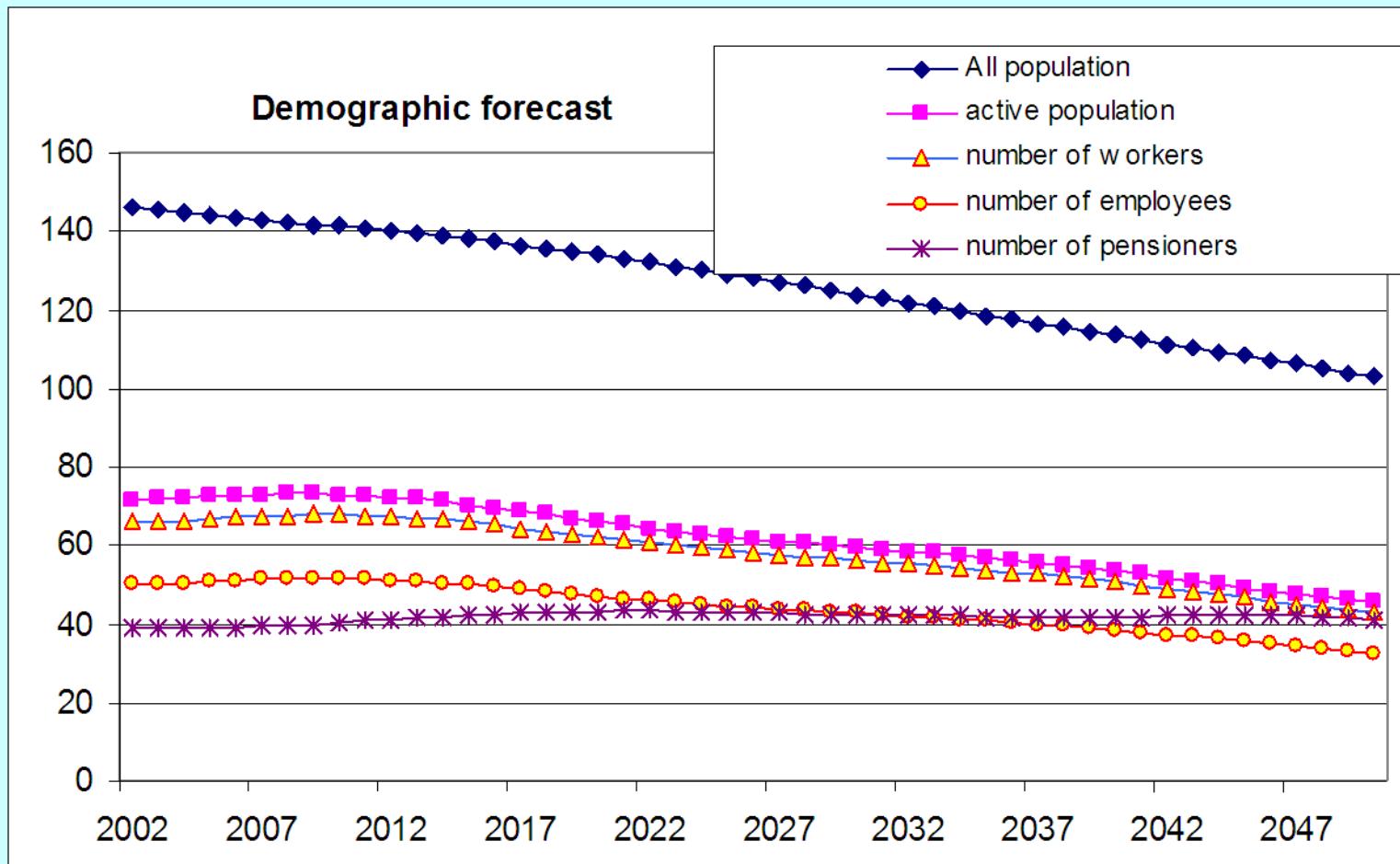
- Identify the number of contributor groups
- Estimate age and gender distributions of contributors over time
- Contribution rates calculation
- Identify the number of pensioner groups
- Estimate age and gender distributions for all pensioner groups over time
- Estimation of the benefit amount
- Determine the payments flow
- Calculate the balance and replacement rate

Key Assumptions
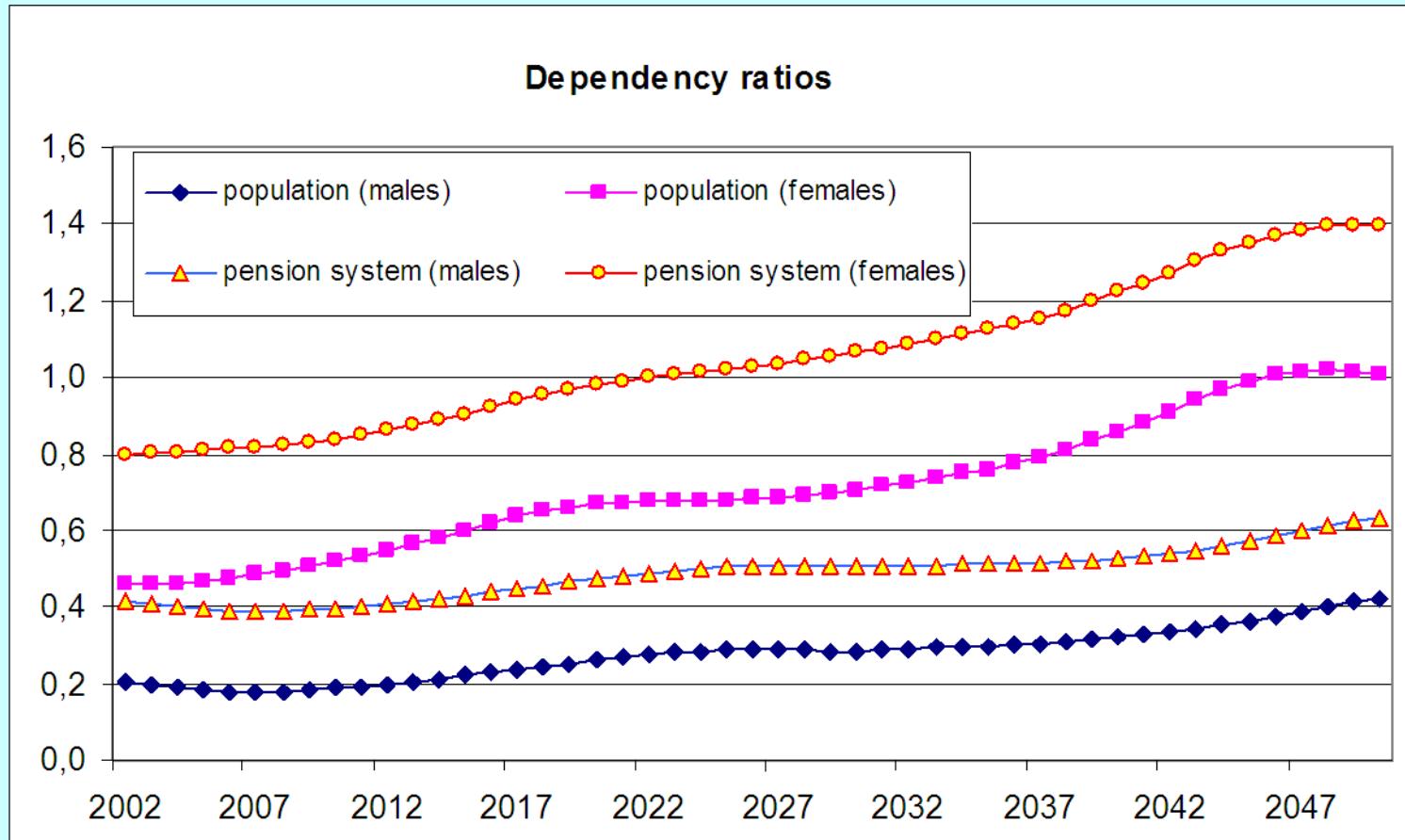
- Demographic projection

- Macroeconomic projection

- Pension system parameters

- Estimation scenarios

Primary Data for Demographic Projection

	2004	2005	2006	2007	2008	2009	2010	2020	2030	2040	2050
Birth rate	1,33	1,35	1,37	1,38	1,38	1,39	1,40	1,45	1,45	1,45	1,45
Life expectancy	66,8	67,0	67,1	67,1	67,2	67,2	67,2	68,3	69,5	70,6	71,8
Men	60,7	60,9	61,1	61,2	61,3	61,3	61,3	62,5	63,8	65,0	66,3
Women	73	73	73	73	73	73	73	74	76	77	78
Total population (mln.)	145	144	143	143	142	142	141	134	124	113	103
Men	67	67	67	66	66	66	66	62	57	51	47
Women	77	77	77	76	76	76	76	72	67	62	56
Number of immigrants - repatriation (mln.)	0,22	0,21	0,20	0,19	0,19	0,18	0,18	0,13	0,13	0,13	0,12
Number of emigrants (mln.)	0,10	0,09	0,08	0,07	0,07	0,06	0,06	0,04	0,04	0,04	0,03
Old age dependency ratio (total population of 60/55)	0,32	0,32	0,32	0,33	0,33	0,34	0,35	0,46	0,49	0,57	0,70
Old age dependency ratio (men 60+)	0,19	0,18	0,18	0,18	0,18	0,18	0,19	0,26	0,29	0,32	0,42
Old age dependency ratio (women 55+)	0,46	0,47	0,48	0,49	0,50	0,51	0,52	0,67	0,71	0,86	1,01

Demographic forecast

Legend:
- All population
- active population
- number of workers
- number of employees
- number of pensioners
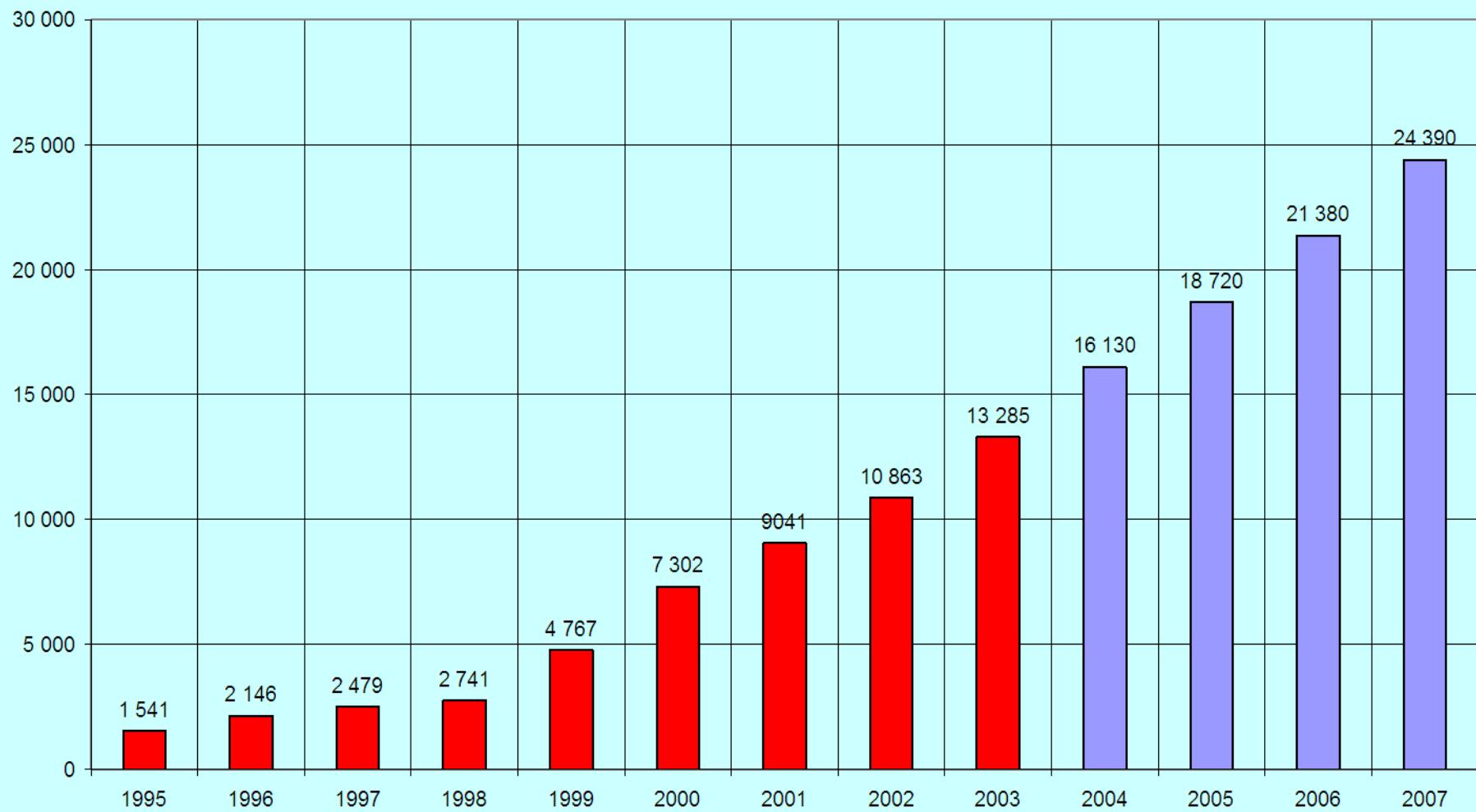
Dependency ratios
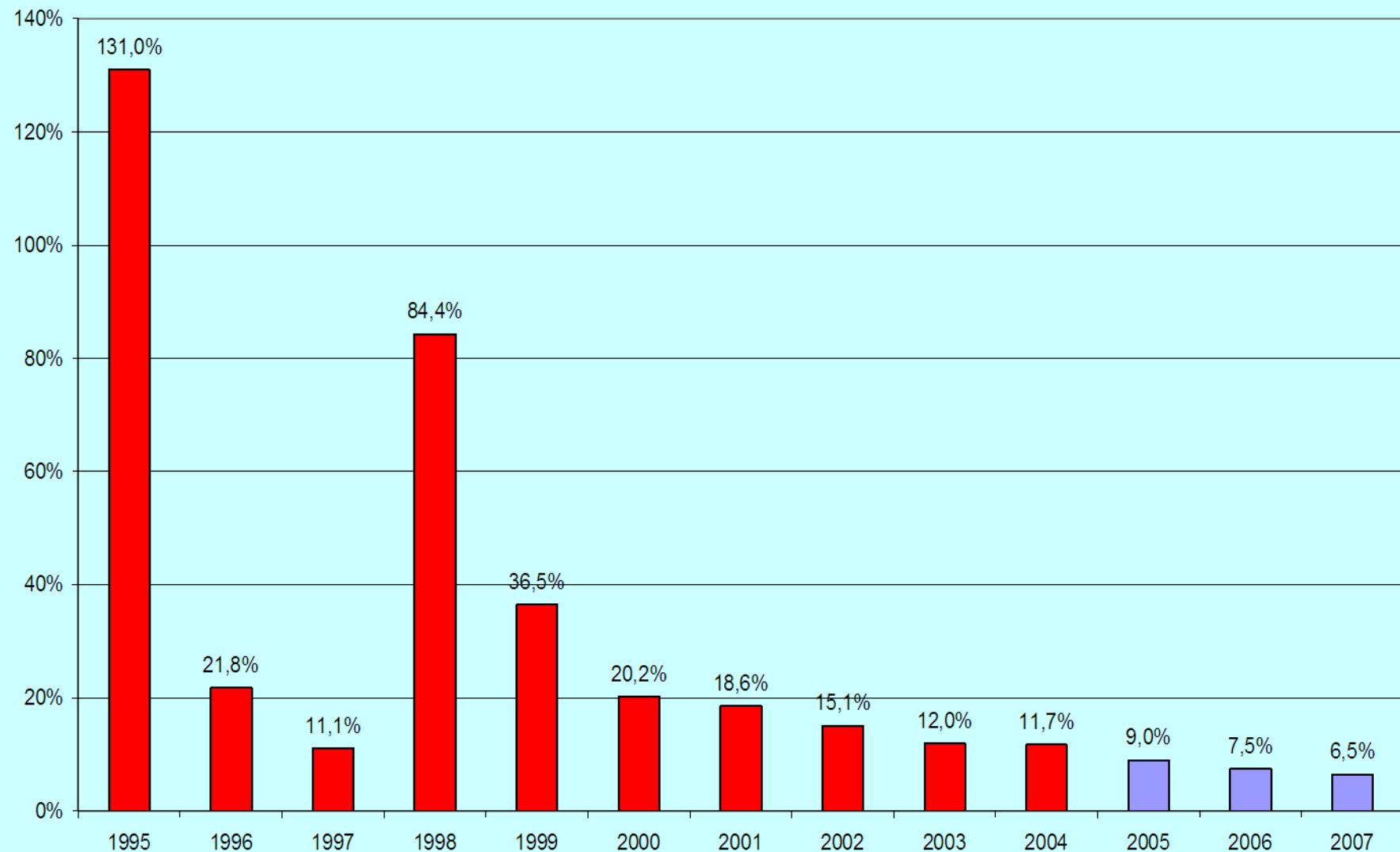
Macroeconomic Projection (baseline scenario)												
	2004	2005	2006	2007	2008	2009	2010	2015	2020	2030	2040	2050
Real productivity growth	6,4	5,7	5,4	5,2	5,1	5,0	5,0	5,2	5,0	4,1	4,5	4,4
Real wage growth	10,3	15,3	11,9	10,5	9,2	8,2	7,6	6,1	5,3	4,2	4,5	4,4
Real GDP growth	6,9	6,3	6,0	5,7	5,4	5,2	5,0	4,2	3,7	3,3	3,1	3,0
Inflation rate	11,7	9,0	7,5	6,5	6,2	5,9	5,6	4,6	4,0	3,4	3,1	3,0
Real interest rate	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,8	3,2	3,5	3,5
Unemployment rate	8,0	7,8	7,6	7,5	7,3	7,1	7,0	6,4	6,0	5,6	5,3	5,1
Labor participation rate	0,62	0,63	0,63	0,64	0,64	0,64	0,65	0,65	0,63	0,60	0,60	0,57
Payroll as % of GDP (employees)	24	26	28	29	30	31	32	34	35	36	36	36

Номинальный ВВП (млрд. руб.)

Год	Значение
1995	1 541
1996	2 146
1997	2 479
1998	2 741
1999	4 767
2000	7 302
2001	9041
2002	10 863
2003	13 285
2004	16 130
2005	18 720
2006	21 380
2007	24 390
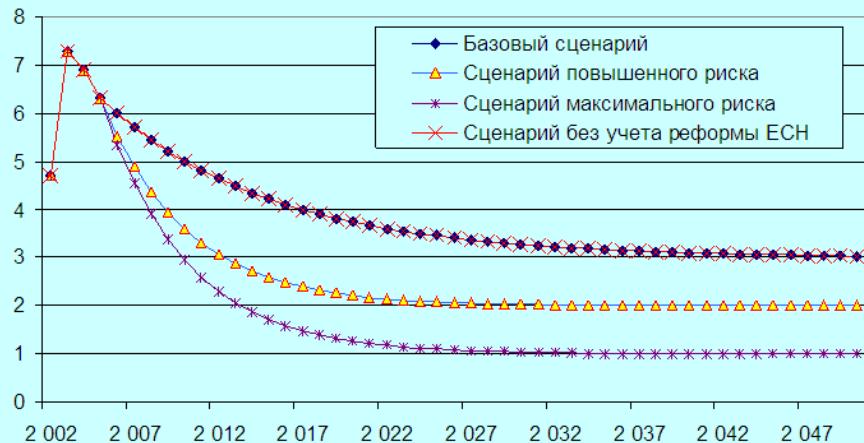
Уровень инфляции
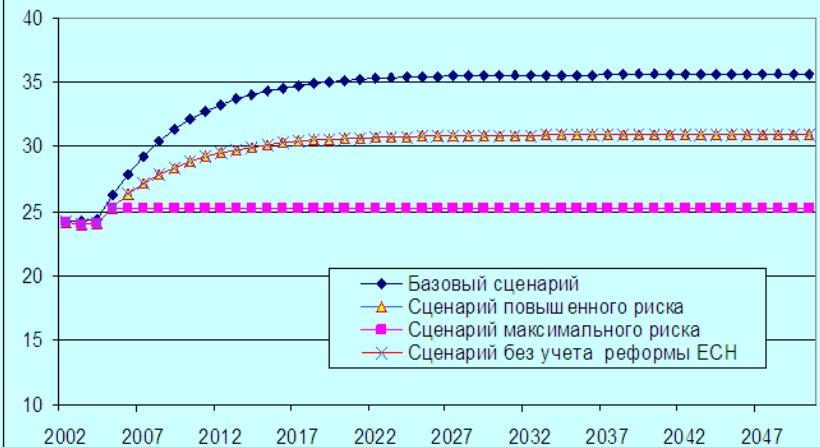
Calculation Scenarios

Scenario	Total contribution rate	Maximal share of employees' payroll in GDP	Macro projection	Indexation of base portion of labor pension
1. Base (PMSL)	20%	35%	High	PMSL
2. Base (CPI)	20%	35%	High	CPI
3. Increased risk	20%	30%	Low	CPI
4. Maximum risk	20	25	Extremely low	CPI
5. Without UST reform	28%	30%	High	PMSL

Темп роста ВВП

- Базовый сценарий
- Сценарий повышенного риска
- Сценарий максимального риска
- Сценарий без учета реформы ЕСН

Доля ФОТ в ВВП

- Базовый сценарий
- Сценарий повышенного риска
- Сценарий максимального риска
- Сценарий без учета реформы ЕСН
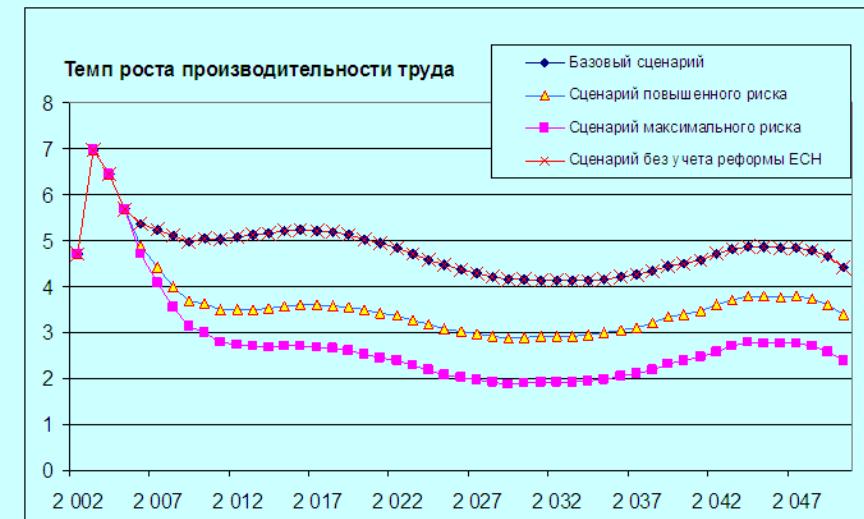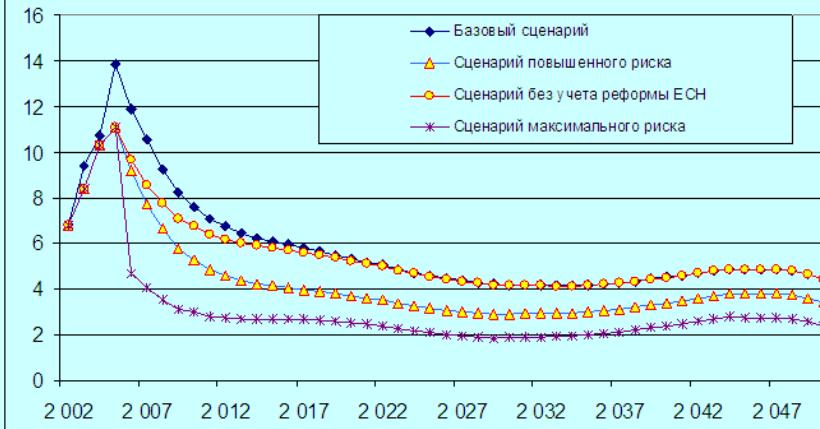
Темп роста производительности труда

- Базовый сценарий
- Сценарий повышенного риска
- Сценарий максимального риска
- Сценарий без учета реформы ЕСН
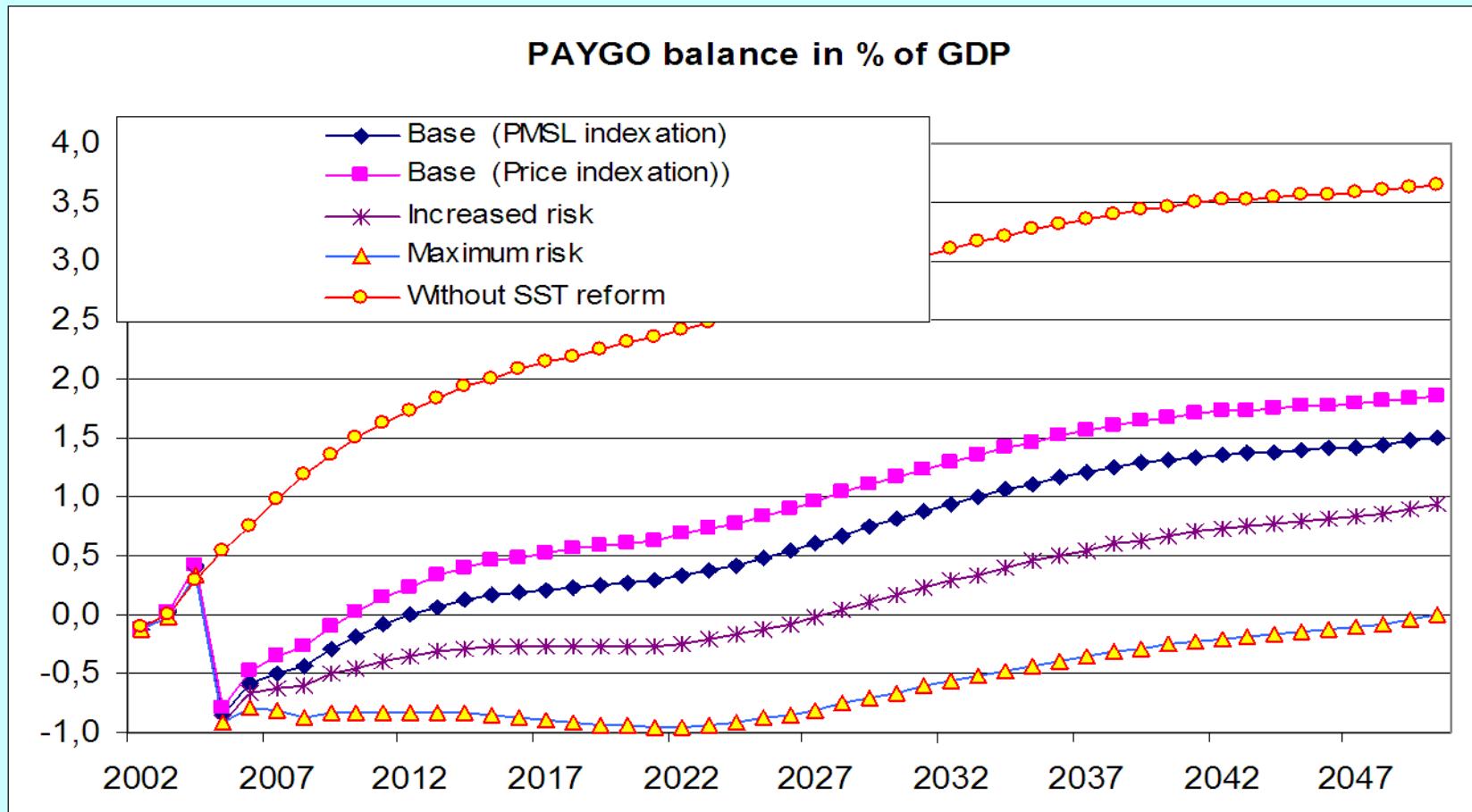
Темп роста заработной платы наемных работников

- Базовый сценарий
- Сценарий повышенного риска
- Сценарий без учета реформы ЕСН
- Сценарий максимального риска
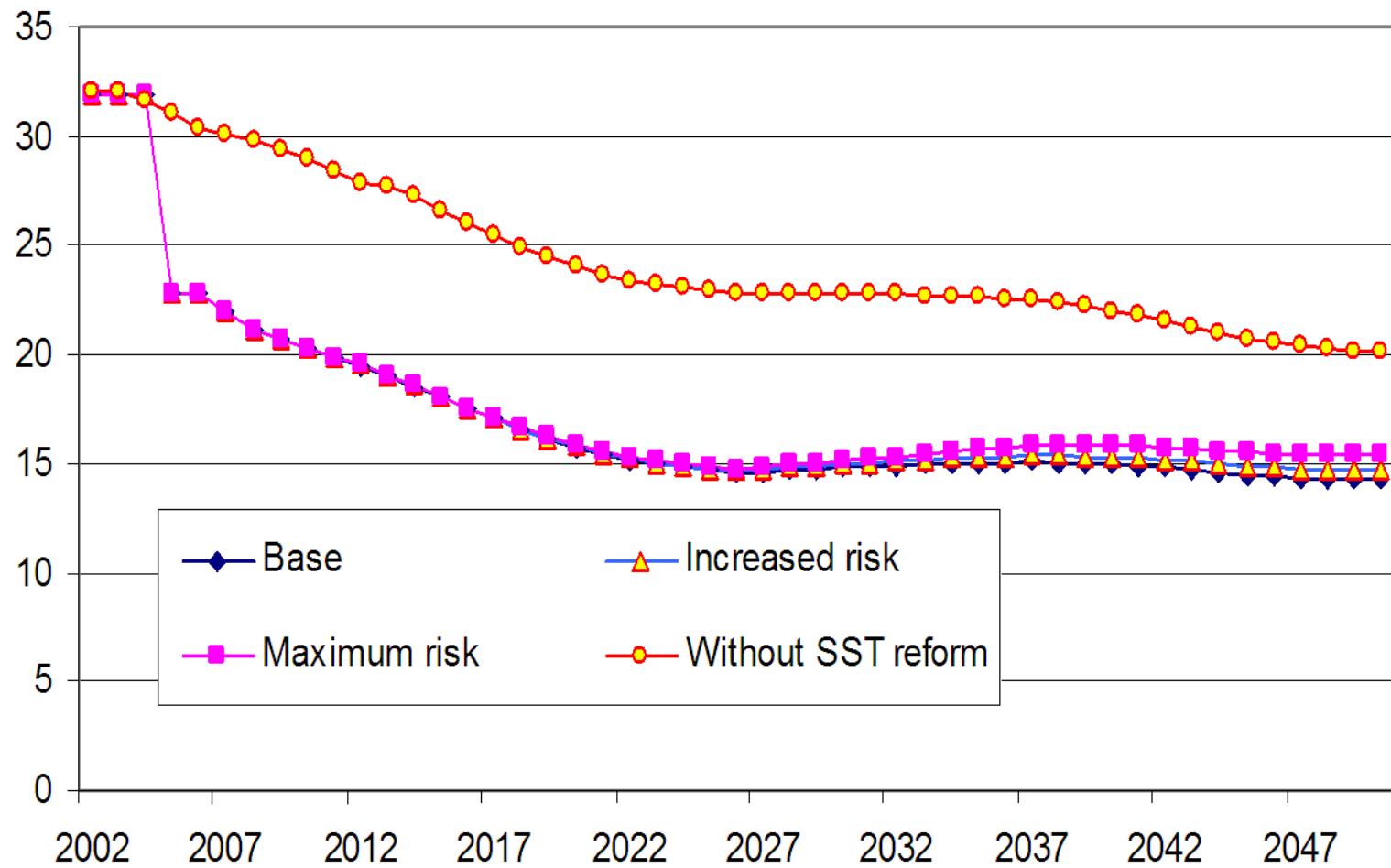
Simulation Outcomes

- Revenues vs. Expenditures

- Replacement rates

- Ratio to pensioner's minimum subsistence level (PMSL)

- Development of equilibrium indexation line
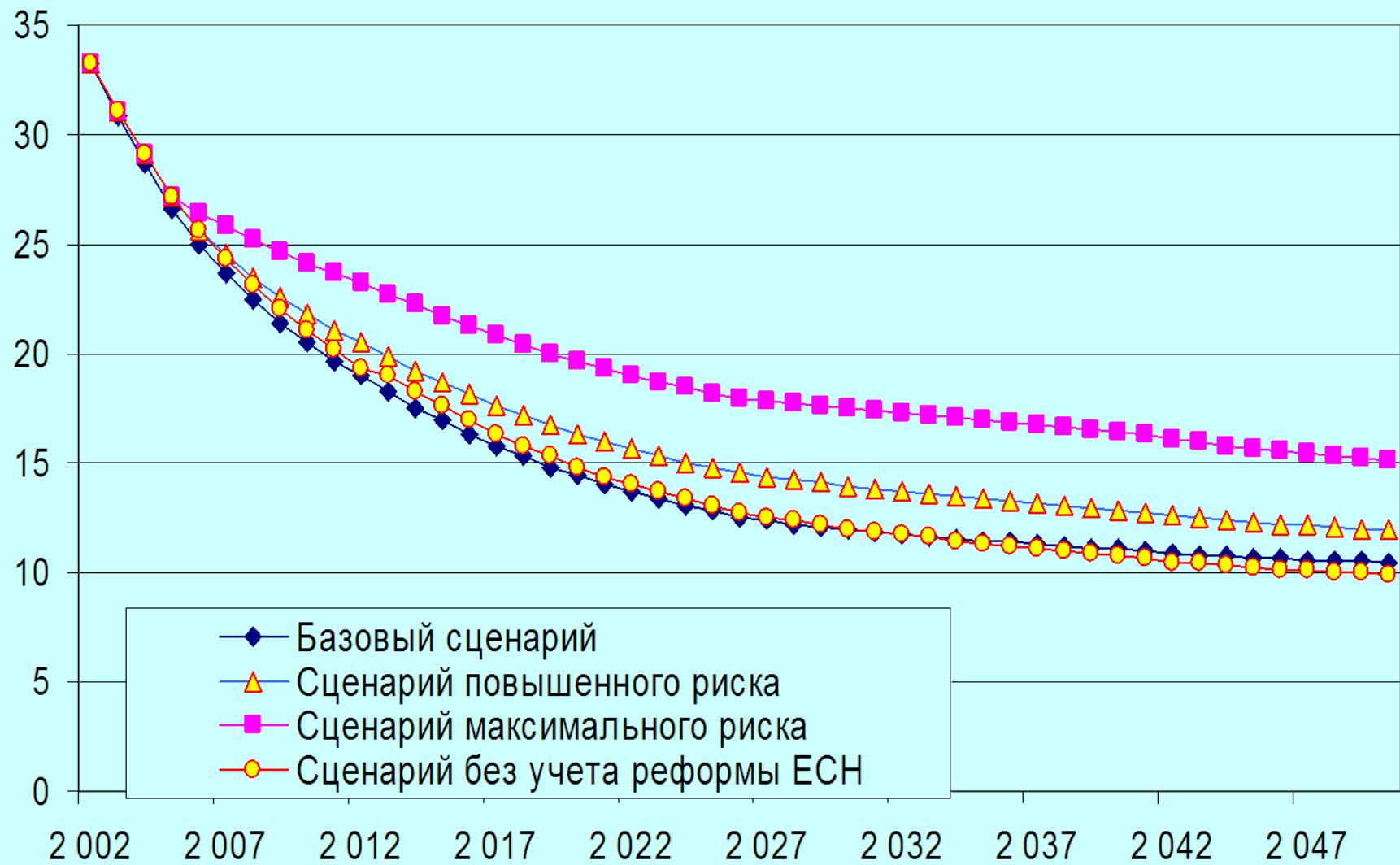
Revenues vs. expenditures of the PAYGO (base and insurance [NDC] components) system, % of GDP

PAYGO balance in % of GDP

Legend:
- Base (PMSL indexation)
- Base (Price indexation))
- Increased risk
- Maximum risk
- Without SST reform

Affordable replacement ratio

Суммарная реальная ставка замещения
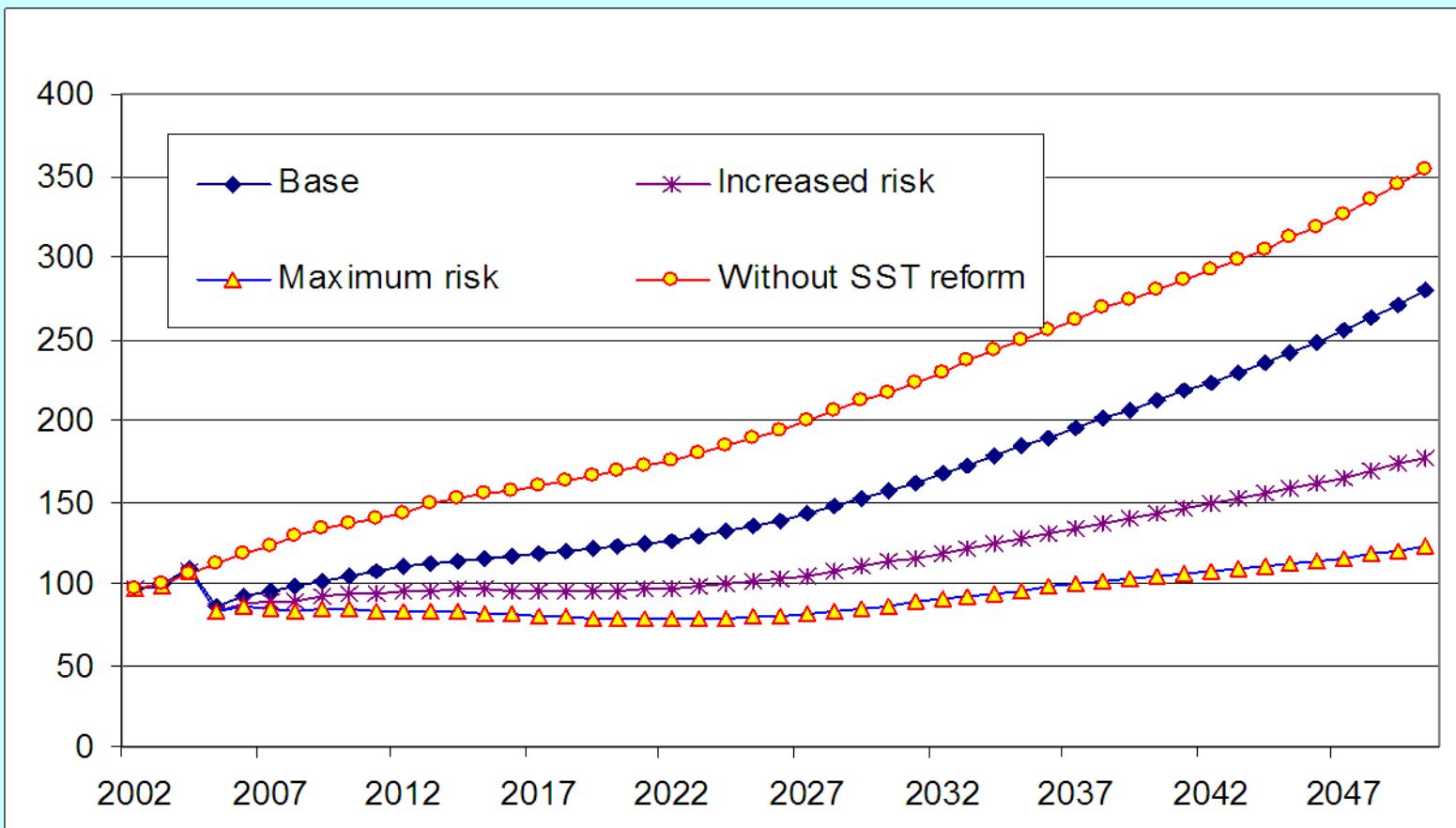
Легенда:
- Базовый сценарий
- Сценарий повышенного риска
- Сценарий максимального риска
- Сценарий без учета реформы ЕСН

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
CPI	131	21,8	11,1	84,4	36,5	20,2	18,6	15,1	12	10	9	7,5	6,5
Wage	472	790	950	1 051	1 523	2 223	3 240	4 360	5 499	6 914	8 450	10 032	11 647
Average annual real wage growth, percentage points													
	1995	1996	1997	1998	1999	2000	2001	2002	2003	**2004**	**2005**	**2006**	**2007**
1995	1,00	37,33	21,92	-3,75	-1,36	2,82	5,93	7,43	8,06	8,74	9,07	9,20	9,18
1996		1,00	8,23	-19,43	-11,67	-4,35	0,56	3,12	4,43	5,61	6,32	6,72	6,93
1997			1,00	-40,02	-20,20	-8,21	-1,27	2,13	3,80	5,24	6,08	6,56	6,80
1998				1,00	6,16	13,54	16,58	16,66	15,84	15,58	15,08	14,49	13,87
1999					1,00	21,43	22,16	20,39	18,39	17,56	16,64	15,73	14,87
2000						1,00	22,89	19,87	17,40	16,62	15,70	14,81	13,96
2001							1,00	16,91	14,74	14,60	13,97	13,26	12,54
2002								1,00	12,61	13,45	13,01	12,36	11,68
2003									1,00	14,30	13,21	12,28	11,45
2004										1,00	12,12	11,28	10,52
2005											1,00	10,44	9,72
2006												1,00	9,01
2007													1,00

|	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
CPI	131	21,8	11,1	84,4	36,5	20,2	18,6	15,1	12	10	9	7,5	6,5
PMSL	186	261	290	348	640	909	1 144	1 379	1 605	1 817	2 040	2 255	2 470
Average annual real pensioner's minimum subsistence level growth index, percentage points													
	1995	1996	1997	1998	1999	2000	2001	2002	2003	**2004**	**2005**	**2006**	**2007**
1995	1,00	14,86	7,26	-9,19	0,22	3,58	4,00	4,10	4,08	3,95	3,86	3,76	3,69
1996		1,00	0,17	-19,26	-4,23	0,94	1,95	2,41	2,63	2,66	2,70	2,71	2,72
1997			1,00	-34,92	-6,35	1,20	2,41	2,87	3,04	3,02	3,02	3,00	2,98
1998				1,00	34,75	26,19	19,11	15,34	12,96	11,22	10,01	9,08	8,37
1999					1,00	18,18	11,99	9,51	8,09	7,03	6,35	5,84	5,46
2000						1,00	6,12	5,42	4,92	4,41	4,13	3,91	3,76
2001							1,00	4,73	4,32	3,85	3,64	3,48	3,37
2002								1,00	3,92	3,42	3,28	3,17	3,10
2003									1,00	2,92	2,96	2,92	2,90
2004										1,00	3,00	2,91	2,89
2005											1,00	2,83	2,84
2006												1,00	2,85
2007													1,00

Affordable Pension Benefit Size vs. Pensioner's Minimum Subsistence Level

Accumulated surplus/deficit curves for different NDC capital indexation rates in the base scenario

Estimation of Replacement Rate in the Funded System

$$RR_f = CR * \frac{\sum_{i=1}^{lc} (1+r_w)^i * (1+r_p)^{lc-i}}{e_x * (1+r_w)^{lc}},$$

where
CR – contribution rate;
r_w – wage growth rate;
r_p – interest rate;
e_x - life expectancy at retirement.
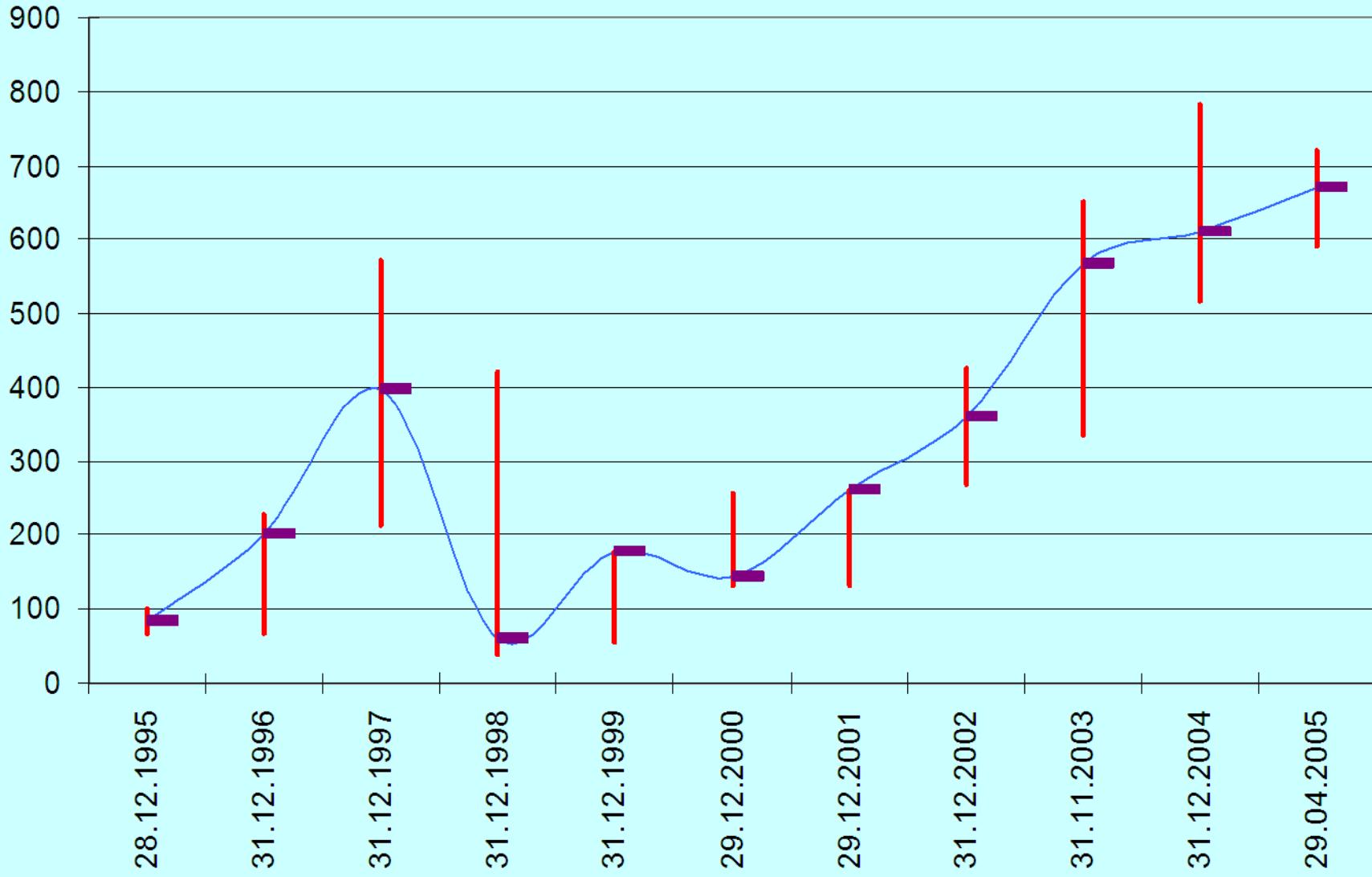
In case the wage growth rate and indexation rate are equal, this expression can be presented as follows:

$$RR_f = \frac{CR * Lc}{e_x}$$

Значения индекса РТС (минимальное, максимальное, в конце года)

Estimation of Replacement Rate in the Funded System

		Interest Rate									
		1	2	3	4	5	6	7	8	9	10
Wage growth rate	1	10,5	12,48	14,94	18,03	21,92	26,82	33,01	40,85	50,79	63,42
	2	8,92	10,5	12,45	14,89	17,93	21,75	26,55	32,6	40,25	49,92
	3	7,67	8,94	10,5	12,43	14,84	17,83	21,59	26,29	32,21	39,67
	4	6,67	7,69	8,95	10,5	12,41	14,79	17,74	21,43	26,04	31,83
	5	5,85	6,69	7,72	8,97	10,5	12,39	14,74	17,64	21,27	25,8
	6	5,19	5,88	6,72	7,74	8,98	10,5	12,37	14,69	17,55	21,12
	7	4,64	5,22	5,91	6,75	7,76	8,99	10,5	12,35	14,64	17,46
	8	4,19	4,67	5,25	5,94	6,77	7,78	9,	10,5	12,33	14,59
	9	3,8	4,21	4,7	5,28	5,97	6,8	7,8	9,02	10,5	12,32
	10	3,48	3,83	4,24	4,73	5,3	5,99	6,82	7,82	9,03	10,5

Forecast for Non-State Pension Funds Market Development
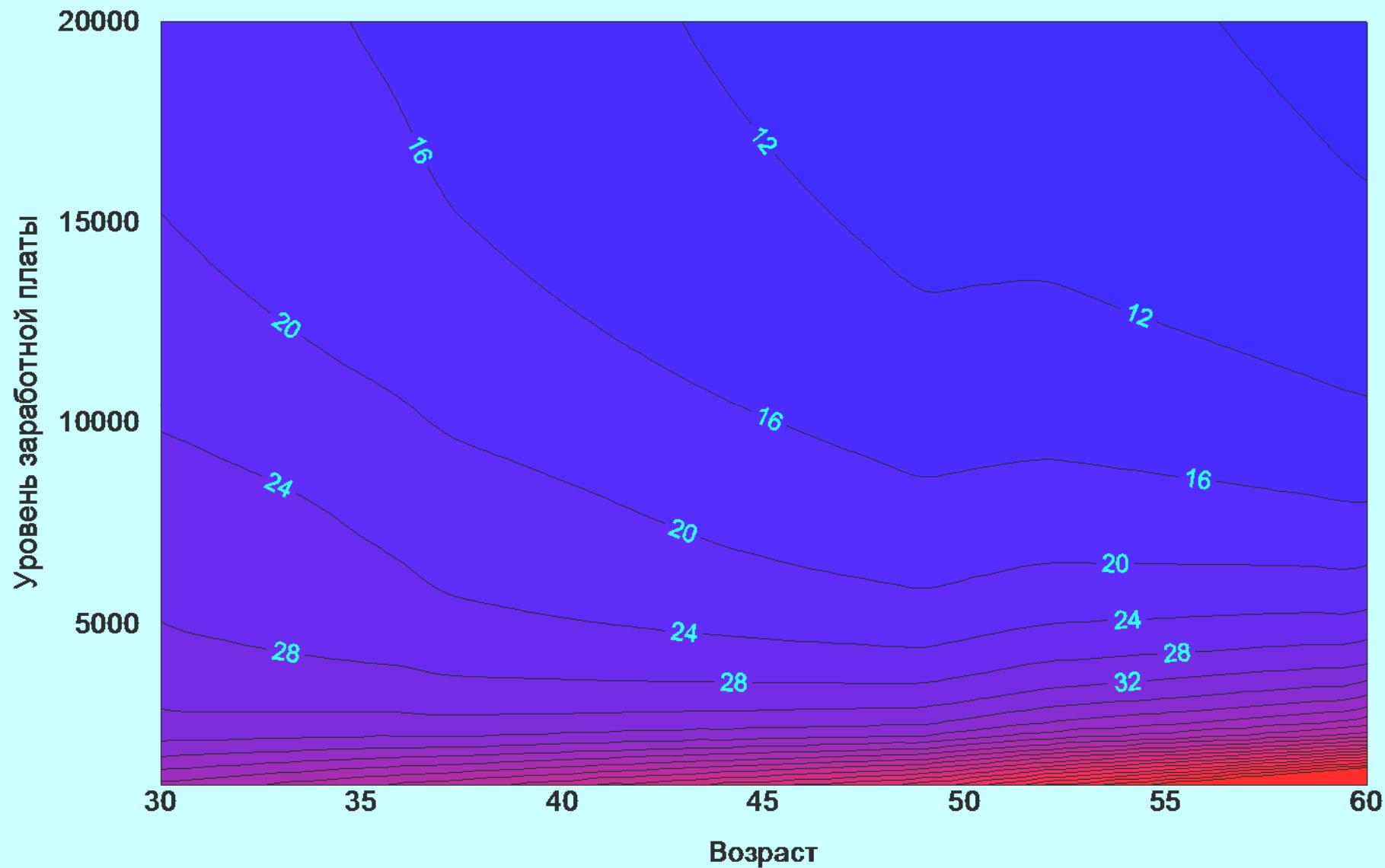
The objective of this forecast is to estimate future pension reserves amounts of Russian non-state pension funds and their influence on the national financial market.

To do this, on the basis of demographic and macroeconomic projections (taking into account additional systemic proposals) non-state pension funds liabilities. Risks of non-state pension funds have also been reviewed.

Key Factors Contributing to the Development of Non-State Pension Funds Market

- *Inadequate public benefits*
- *Predicted growth of the dependency ration which results in a lower replacement rate*
- *Low replacement rate for high wages*

Ставка замещения трудовой пенсии

Primary Data and Assumptions Used in Simulation

- Key performance indicators of non-state pension funds based on reporting data

- Demographic projections

- Macroeconomic projections

- Replacement rate forecast in non-state pension system

- Coverage and level of funding of pension liabilities at the accumulation and payout stage

	2004	2005	2006	2007	2008	2009	2010	2011
Total population (mln.)	144,5	143,9	143,4	142,8	142,3	141,7	141,2	140,6
Share of new non-state pension funds participants eligible for benefits among those retired in this particular year	**8%**	10%	13%	15%	18%	20%	23%	25%
Total participants of non-state pension funds eligible for non-state benefits (mln.)	0,44	0,58	0,76	1,00	1,29	1,62	2,00	2,43
Number of non-state pension funds participants not eligible for non-state benefits (mln.)	4,98	5,47	6,03	6,63	7,27	7,91	8,54	9,15
Total participants of non-state pension funds (mln.)	5,42	6,05	6,79	7,64	8,55	9,53	10,55	11,58
Average non-state pension (RUR)	**800**	1 072	1 358	1 675	2 024	2 407	2 832	3 300
Total benefits (bln. RUR)	4,2	7,5	12,4	20,1	31,3	46,7	68,1	96,1
Average wage (RUR)	6 445	8 099	9 741	11 467	13 297	15 233	17 312	19 528
Average pension (non-state pension funds) to average wage (%)	12,4%	13,2%	13,9%	14,6%	15,2%	15,8%	16,4%	16,9%
Pension liabilities of pensioners with non-state pension funds (bln. RUR)	31	57	100	169	272	419	631	918
Pension liabilities for contributors - non-beneficiaries (bln. RUR)	87	144	221	328	469	650	879	1 161
Total pension liabilities (bln. RUR)	118	201	322	497	740	1 069	1 510	2 080
Total pension liabilities in base year prices (bln. RUR)	118	185	274	398	559	762	1 020	1 333
Total pension liabilities in non-state pension funds as % of GDP	0,7%	1,1%	1,5%	2,1%	2,7%	3,6%	4,5%	5,6%
Pension reserves of the public funded system (bln. RUR)	183	292	436	653	973	1 375	1 873	2 479
Total pension reserves of the public funded system as % of GDP	1,1%	1,8%	2,3%	2,8%	3,6%	4,3%	5,1%	5,9%

Risks for Non-State Pension Funds

- Risk of accumulations value loss due to offsetting wage growth

- Investment risks

- System risks (risks of regulation)

Conclusions

- PAYGO system deficit could be eliminated. Replacement ratio decreases till 15%.

- Funded pillar will not sufficiently change replacement ratio. Under conditions of high wage growth funded pillar is not efficient.

- It is necessary to boost non-state pension system to mitigate pension risks.

Conclusions

It has been demonstrated that with the offsetting growth of the payroll share in the GDP and 50% indexation rates, the deficit of PAYGO in 2005 may reach 1 % of the GDP. Later, thanks to the outpacing wage growth, the deficit could be eliminated by 2010-2012 in the base scenario, and by 2025 – in the high-risk scenario.

Scenarios of increased and maximum risk were run where low growth rates of the GDP and wages were used. Such conditions lead to a reduction in the pension fund revenues. Under the increased risk scenario the deficit of the pension system will remain till 2030. In the maximum risk scenario the system suffers deficit throughout the entire projection period.

The PAYGO system accrued deficit was calculated with various indexation rates of the insurance [NDC] pension. Accumulated deficit/surplus curves have been constructed that help to estimate the indexation rate for the insurance [NDC] part of the labor pension and insurance [NDC] capital. Maximal accrued deficit of PAYGO system reaches 4% of GDP in 2025 in case of 70% NDC indexation based on the real wage growth. On the other hand if NDC indexation is 40% of real wage growth, the accrued surplus of PAYGO in the same year will be 5% of GDP.

Conclusions

Under the reviewed macroeconomic scenarios, it has been shown that the PAYGO balance deficit formed as a result of the contribution rate reduction goes down faster if the payroll share in the GDP grows at a higher rate. It was demonstrated that it is possible that pension system balance remains stable for a long term period. It could happen if the insurance (NDC) pension is indexed by 50% of the wage growth.. The base part of labor pension in this case could be indexed based on the pensioner's minimum subsistence level (PMSL) growth rate.

It has been demonstrated that with a considerable growth of wages the pensioner's minimum subsistence level grows faster than the consumer price index, - at approximately 30 % of the wage growth rate. Despite reduction of the replacement rate, the ratio of average benefit size to pensioner's minimum subsistence level keeps growing because of the fast projected growth of wages.

The funded scheme under high wage growth conditions is not efficient. However, given the slowdown of the wage growth and development of the financial market, the funded component of the labor pension in the future may become commensurate with the size of the benefit provided by the PAYGO system.

Conclusions

Development of the non state pension system could achieve the following characteristics: by 2010, the number of participants from 10% could increase to 25% of all pensioners; replacement ratio for voluntary pension could reach 25% (compared to 12% as of now), the amount of pension reserves in the non-state sector may be commensurate with the amounts in the funded component of the public pension system. Risk factors for such developments are inflation risks (high wage growth), small absorbing capacity of financial markets, and unpredicted regulations changes (i.e. taxation regulations changes and other). A well-developed non state pension system could be a tool to mitigate possible unforeseen risks/failures of the state pension system development.