CAN WE AFFORD PENSIONS IN THE LONG RUN?

THE CASE OF ESTONIA

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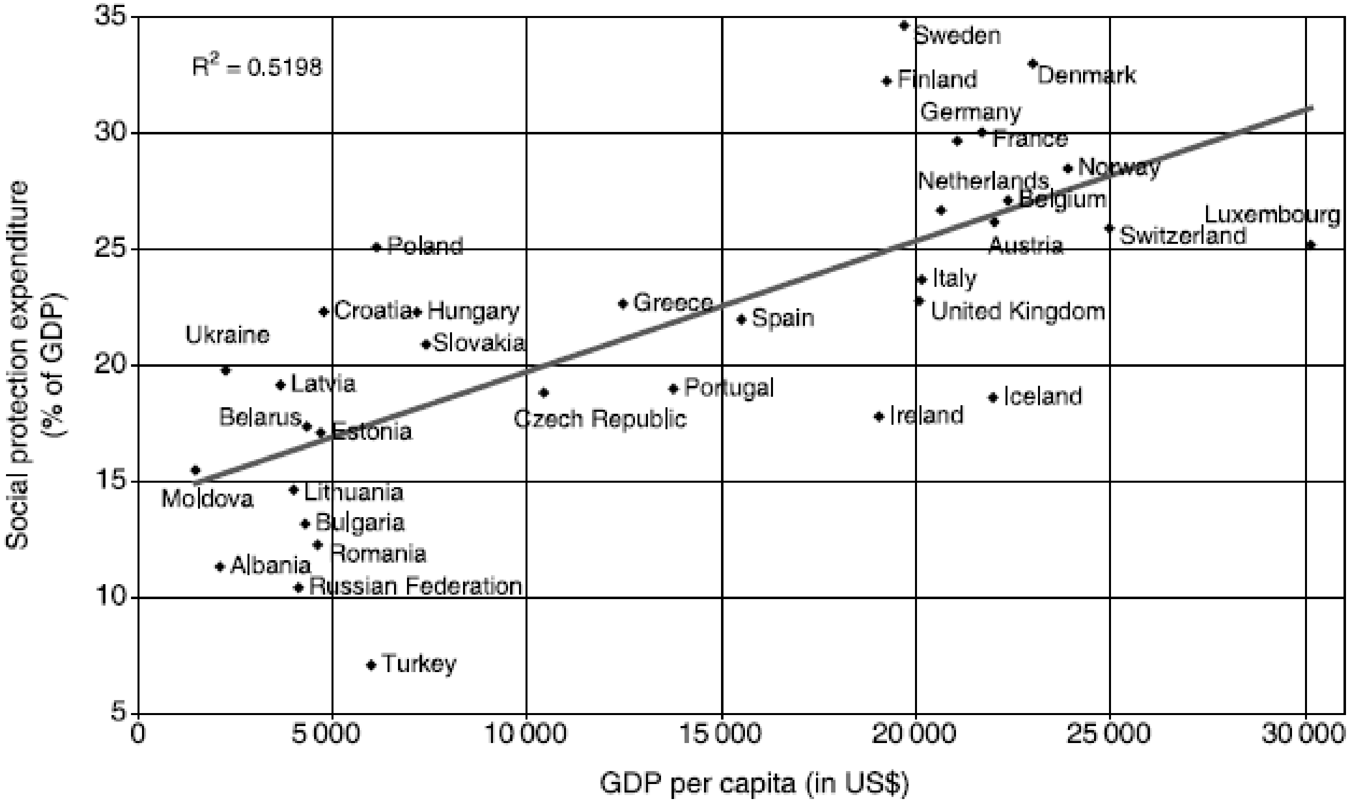
18/06/2015

MOTIVATION

Figure 2.2 Social protection expenditure ratio to GDP and GDP per capita in Europe



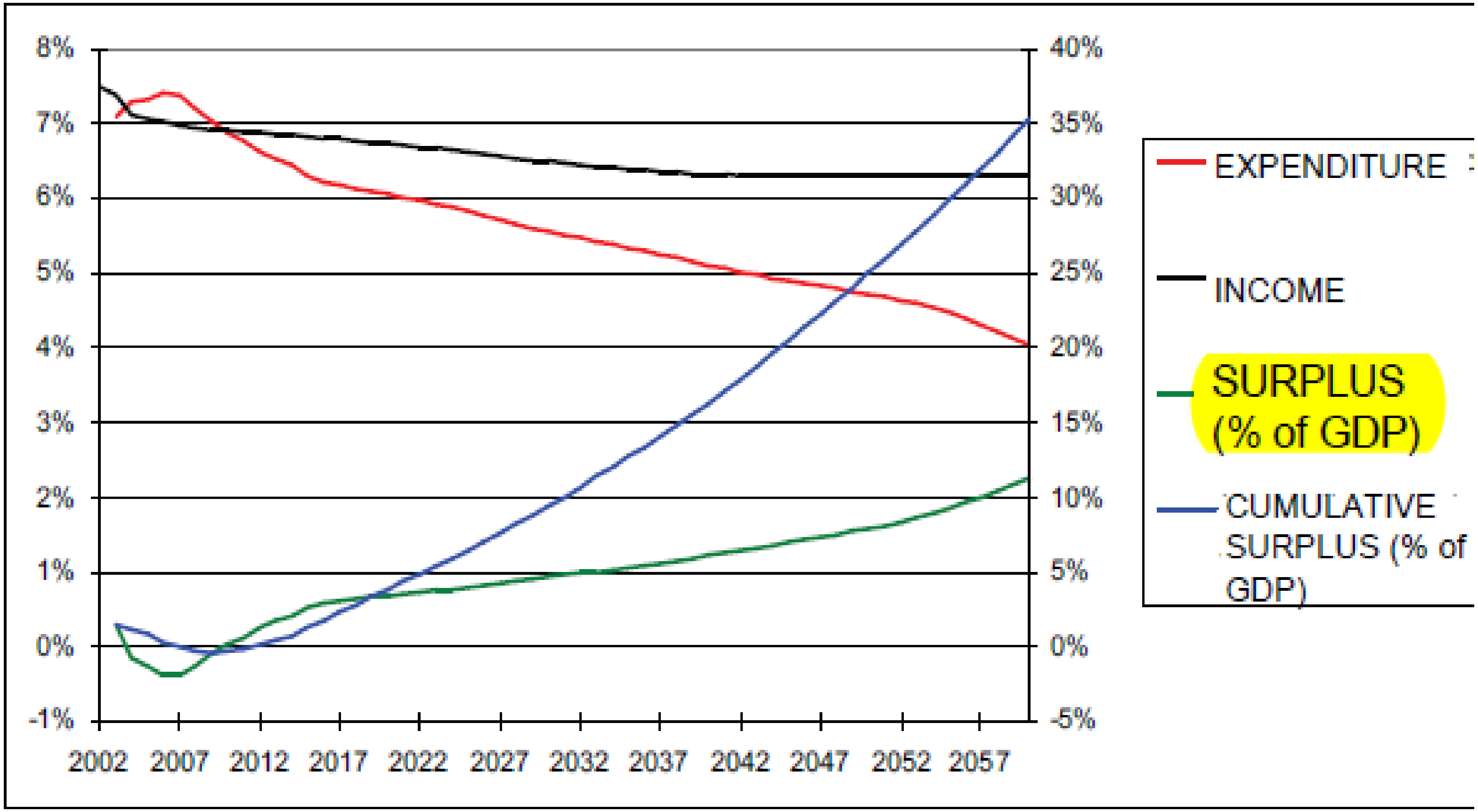
MOTIVATION CONT

- According to Whitehouse (2007), the average male life expectancy at age 65 is expected to increase from **15.1 to 18.5** in the OECD countries, and that of females from **18.7 to 22.2** in 50 years.
- More in developing world!

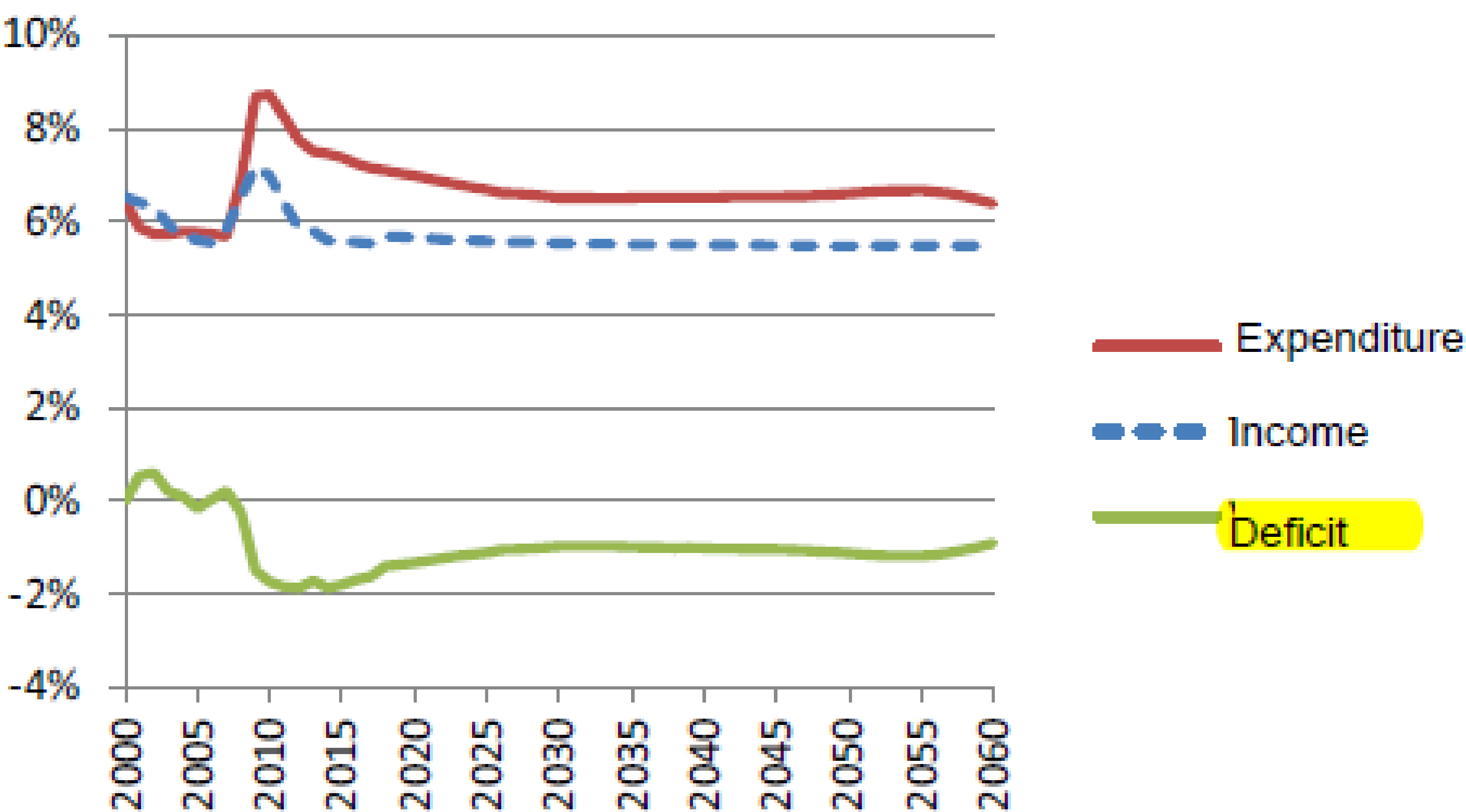
FORECAST: THINKING PROCESS

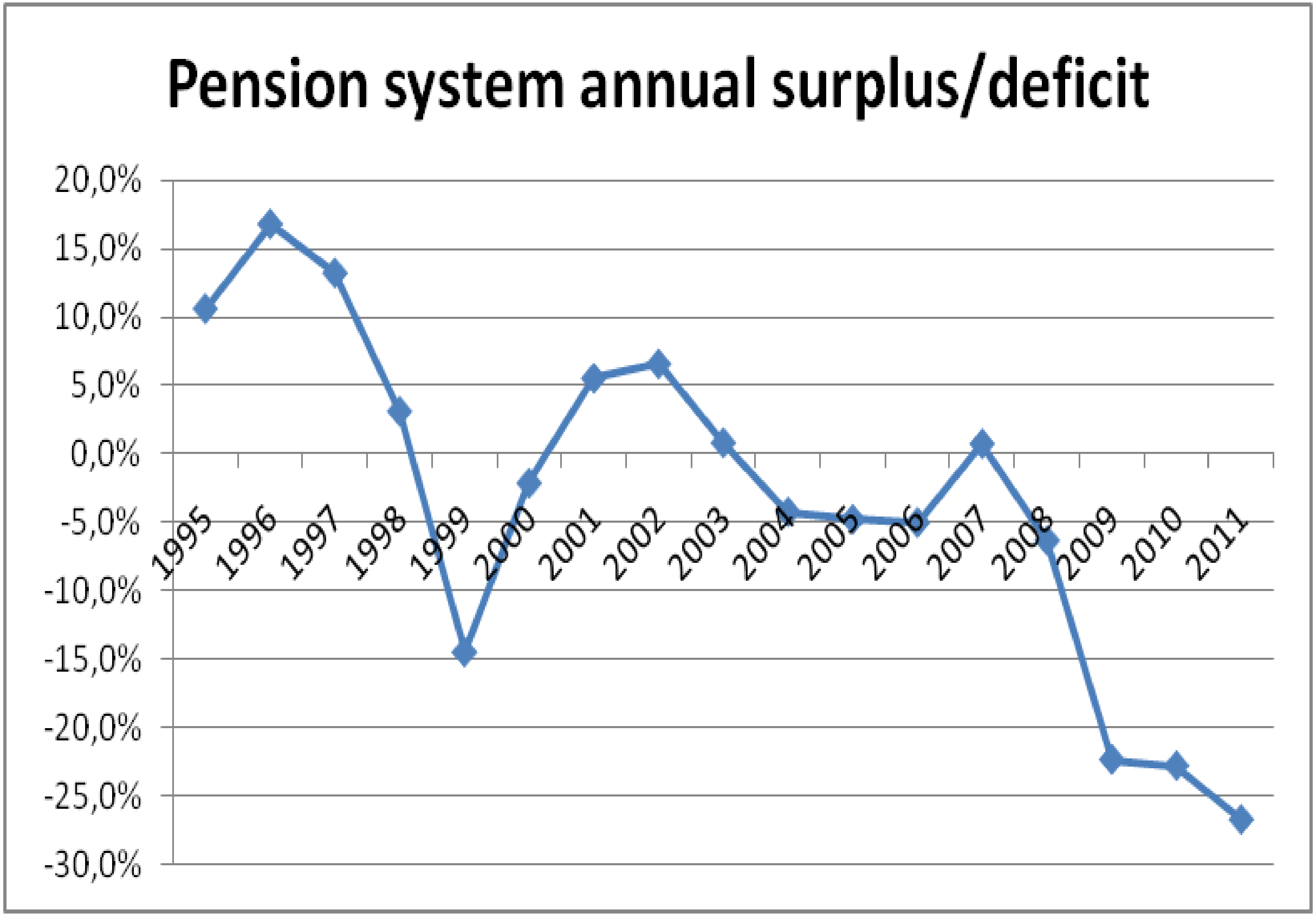
- **The degree of uncertainty in forecasting social budgets (pensions, health care)**
  - Population projections: stable
  - Labour supply projections: highly uncertain
  - Economic growth forecast: highly uncertain

2004: SITUATION IS VERY GOOD



2011: THERE IS A SHARP DEFICIT



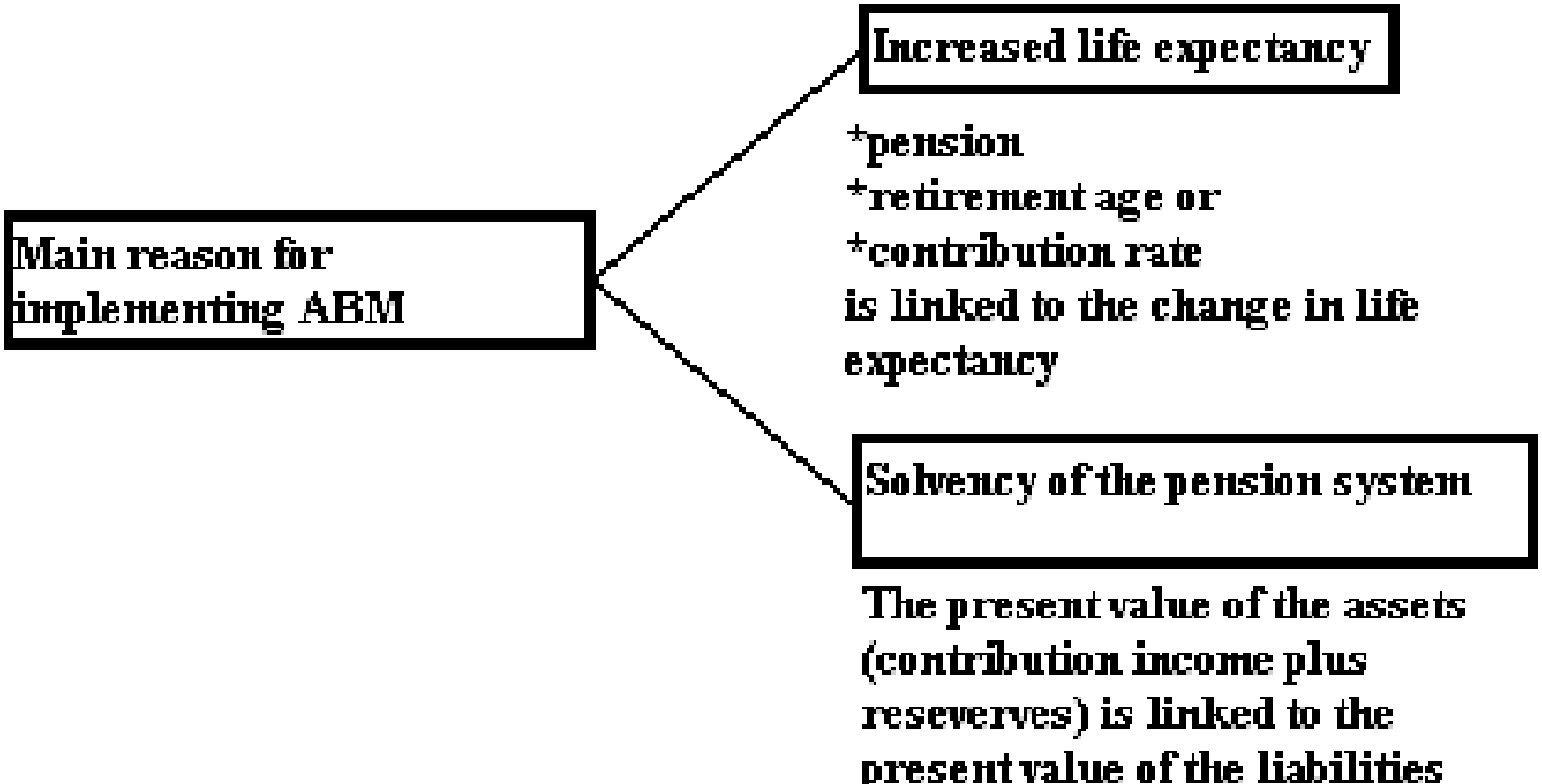

Pension system annual surplus/deficit
20,0%
15,0%
10,0%
5,0%
0,0%
-5,0%
-10,0%
-15,0%
-20,0%
-25,0%
-30,0%
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011

AUTOMATIC BALANCING MECHANISMS:

"Depoliticise the management of the Defined Benefit PAYG system by adopting measures with a long-term planning horizon, which will bring about greater intergenerational fairness and re-establish the equilibrium, sustainability or financial solvency of the system."

Vidal-Melia, Boado-Penas & Settergren (2009)

2 REASONS FOR ABMS:



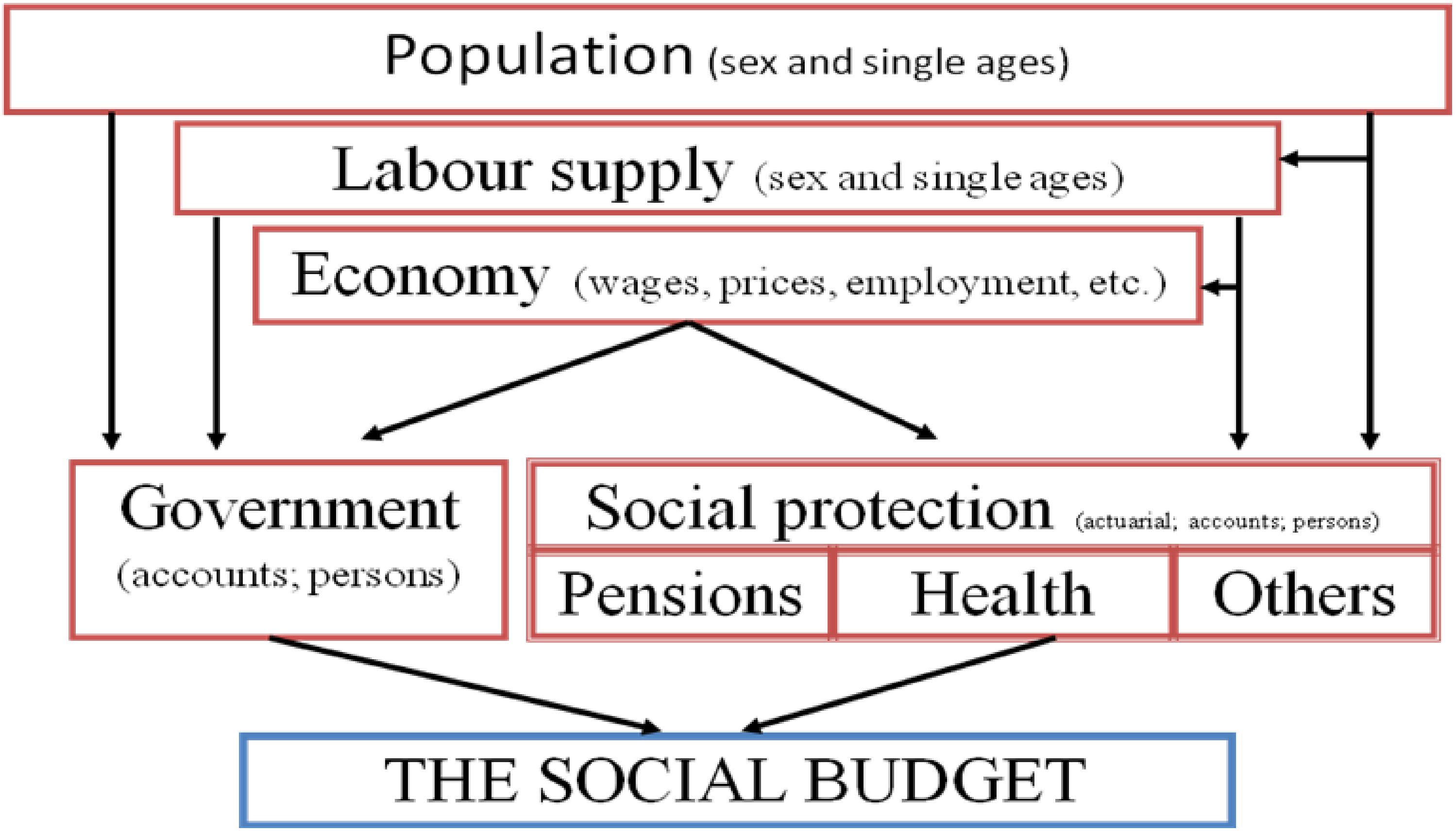
HOW TO MAKE A PENSION SYSTEM FINANCIALLY SUSTAINABLE?

LIFE EXPECTANCY RETIREMENT AGE

LIFE EXPECTANCY PENSIONS

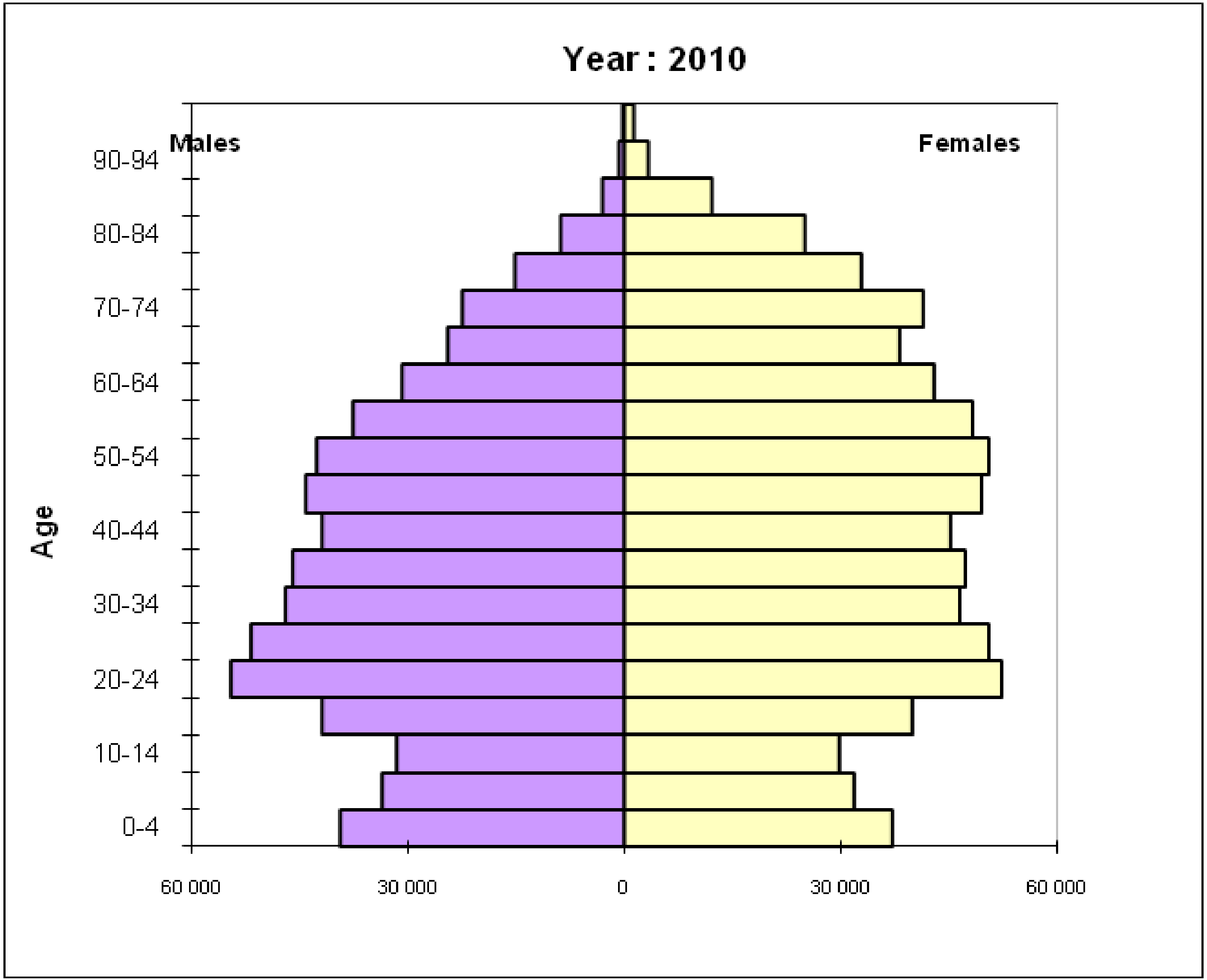
CONTRIBUTION INCOME = BENEFIT EXPENDITURE

METHODOLOGY



Source: ILO

2010 Population Pyramid



ASSUMPTIONS

Table 1. Main assumptions used in simulation, annual change (in %)

	2011	**2020**	**2030**	**2040**	**2050**	**2060**
Assumptions:						
GPI growth (=GDP deflator)	1,9%	2,4%	2,3%	2,3%	2,2%	2,1%
Labour productivity growth (=Real wage growth)	2,8%	3,6%	3,0%	1,1%	0,8%	1,3%
Employment growth	1,16%	0,01%	0,29%	-0,55%	-0,90%	-0,44%
Results:						
Real GDP growth	4,0%	3,6%	3,0%	1,1%	0,8%	1,3%
Nominal growth of social tax revenues	6,6%	6,1%	5,4%	3,4%	3,0%	3,4%
Pension index growth	5,8%	5,3%	4,8%	3,2%	2,9%	3,2%

ASSUMPTIONS CONT

Table 10. Male (M) and female (N) life expectancy at 65 (base scenario)

	Historical data				Projection										
	1990	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**
M	*12,0*	*11,9*	*12,6*	*13,0*	14,1	14,8	15,6	16,3	17,0	17,7	18,4	19,1	19,7	20,5	21,1
N	*15,8*	*16,1*	*17,0*	*18,0*	19,2	19,9	20,5	21,1	21,7	22,3	22,8	23,4	23,9	24,5	25,1

Source: Eurostat and Praxis

ASSUMPTIONS CONT

- Healthy ageing
- Demand for (elderly) labour force
- 0 migration

POLICY OPTIONS (2026-2060)

1) Indexing pensions for life-expectancy
2) Linking the retirement age to life expectancy
3) Linking pension to the change in the number of pensioners (2015-2050)
4) Linking the retirement age to the ratio of pension period over working period
5) Adjusting pensions to the difference in long-term pension system financial balance (2015-2050)

THE OBJECTIVES OF THE ABM SUBMODEL:

1) manipulating the **inputs** of the Praxis pension model (e.g. changing the retirement age)
2) manipulating the **outputs** of the Praxis pension model (e.g. manipulating the pension expenditure)

HOW TO COMPARE POLICY OPTIONS:

1) Financial indicator (Annual deficit/ surplus)
2) Pension level indicator (replacement ratio)

FLEXIBLE PENSION AGE IN FINLAND

Year becoming 62	Year of birth	Increase in discounted life expectancy (compared to the 62 year-olds in 2009)	Life expectancy coefficient	How much should one postpone retirement to balance the negative effect of the indicator*
2009	1947	0 m	1	0 m
2010	1948	2 m	0,9917	1 m
2011	1949	4 m	0,987	2 m
2012	1950	7 m	0,878	3 m
2013	1951	9 m	0,971	5 m
2014	1952	11 m	0,963	6 m
2019	1957	1 y 9 m	0,93	11 m
2024	1962	2 y 7 m	0,902	1 y 4 m
2029	1967	3 y 5 m	0,876	1 y 9 m
2034	1972	4 y 2 m	0,854	2 y 2 m
2039	1977	4 y 11 m	0,833	2 y 6 m
2044	1982	5 y 7 m	0,815	2 y 9 m
2049	1987	6 y 2 m	0,799	3 y 1 m

* Assumption: the replacement rate is 60 % of the pre-retirement income. The individual continues to earn the pre-retirement income.

Source: Tenhunen & Vaittinen (2010, pg. 37)

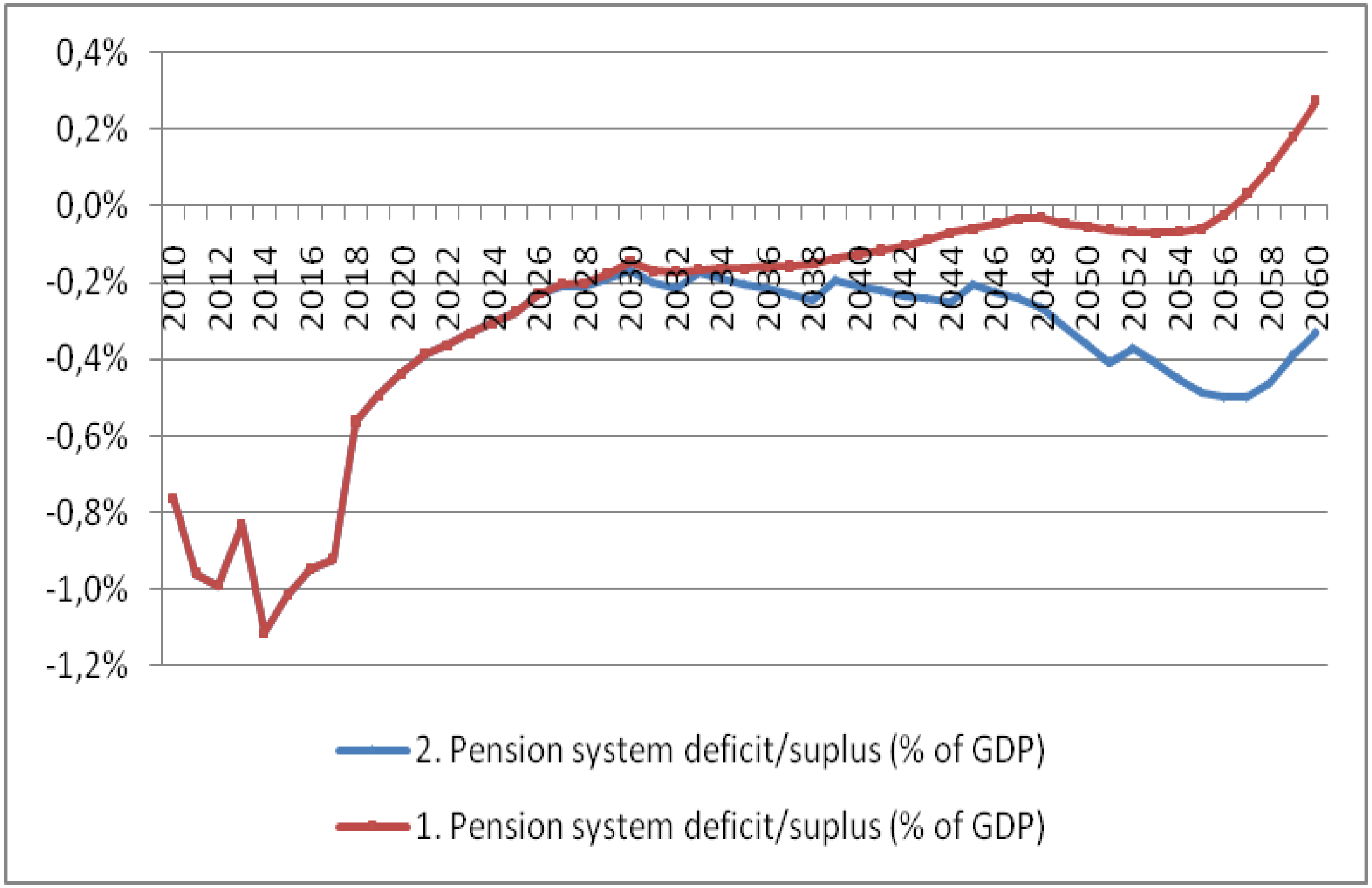
IMPLEMENTATION IN ESTONIA

Birth year	**Coefficient calculation year**	**Unisex life expectancy at 65**	**Life expectancy change**	**How much one has to postpone retirement**[35]	**Life expectancy coefficient**
1961	2026	15,5	0 m	0 m	100%
1963	2028	15,7	2 m	1 m	99%
1965	2030	15,9	4 m	2 m	98%
1967	2032	16	6 m	3 m	97%
1969	2034	16,2	7 m	4 m	96%
1971	2036	16,4	10 m	5 m	95%
1973	2038	16,5	1 y	6 m	94%
1975	2040	16,7	1 y 2 m	7 m	93%
1977	2042	16,9	1 y 4 m	8 m	92%
1979	2044	17	1 y 6 m	9 m	91%
1981	2046	17,2	1 y 8 m	10 m	90%
1983	2048	17,4	1 y 10 m	11 m	89%
1985	2050	17,6	2 y	1 y	88%
1987	2052	17,7	2 y 2 m	1 y 1 m	87%
1989	2054	17,9	2 y 5 m	1 y 2 m	86%
1991	2056	18,1	2 y 7 m	1 y 4 m	85%
1993	2058	18,3	2 y 10 m	1 y 5 m	84%
1995	2060	18,5	2 y 11 m	1 y 5 m	84%

*life expectancy is discounted with 2%

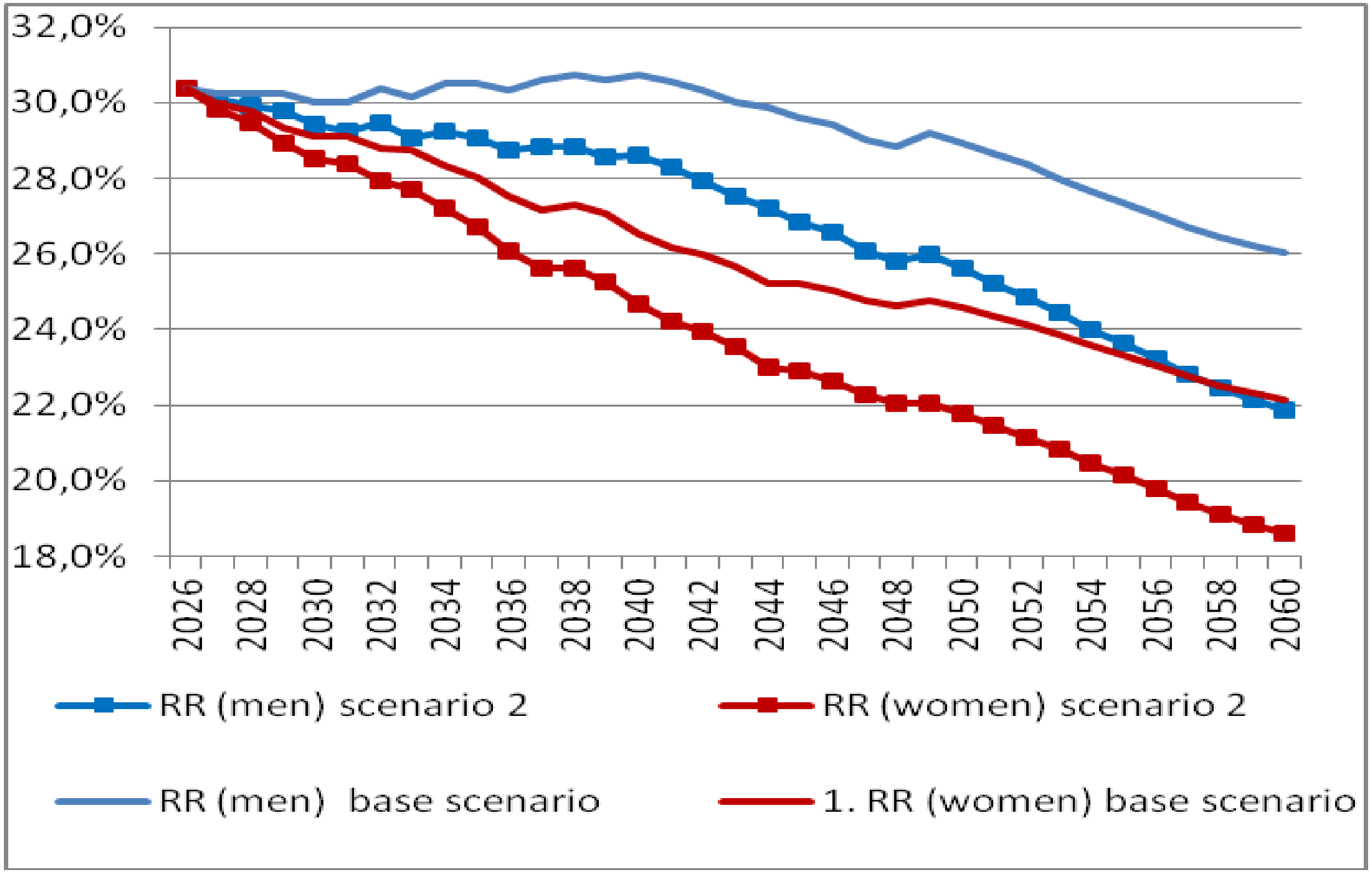
OPTION 1: FLEXIBLE PENSION AGE

- *Scenario 1*: No cuts in pensions
- *Scenario 2*: Everyone will retire at 65 - cuts

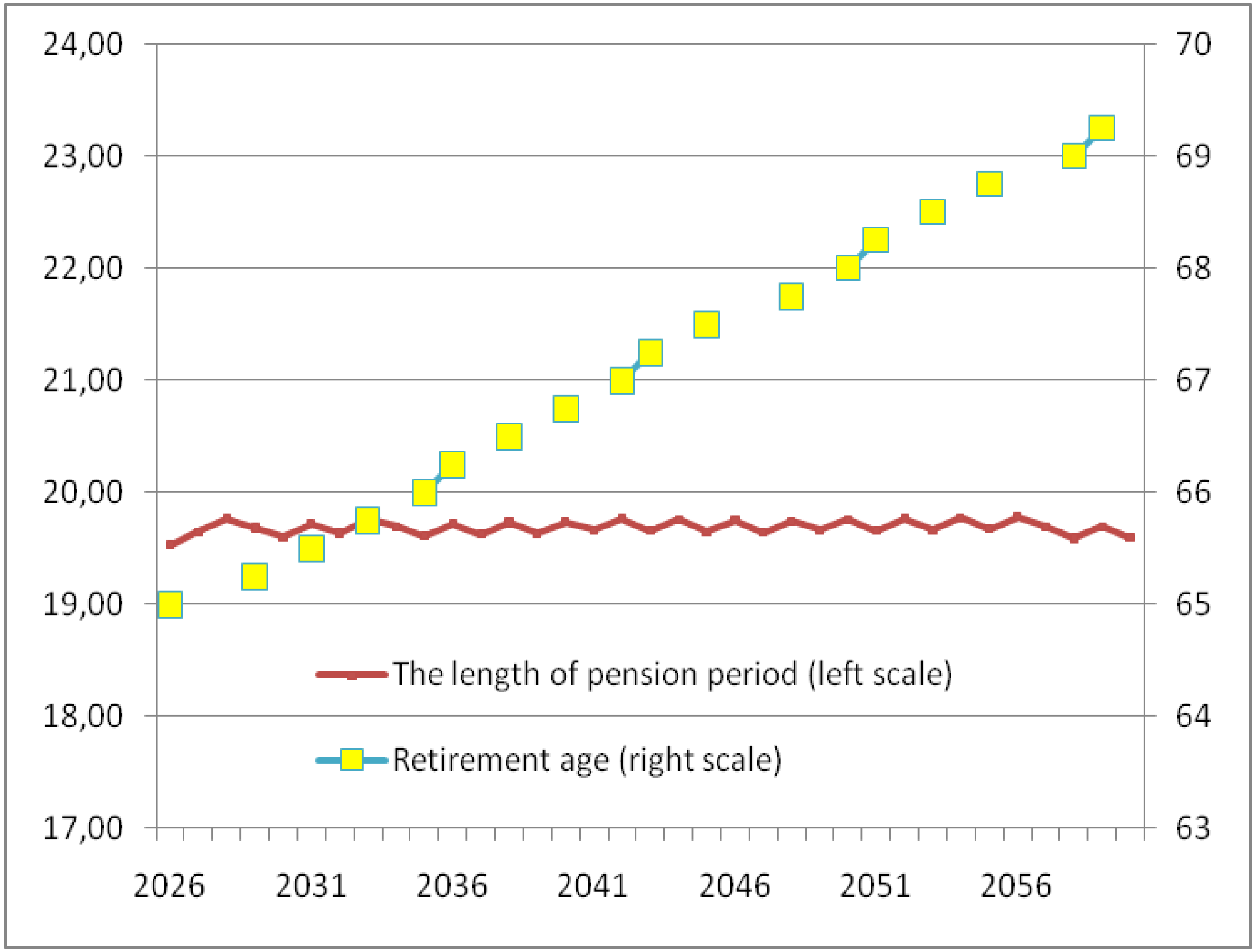


1. FLEXIBLE PENSION AGE

- *Base scenario ≈ scenario 1 (no cuts)*
- *Scenario 2: Cuts in pensions*



2. PENSION AGE INDEXED FOR LIFE-EXPECTANCY CHANGE



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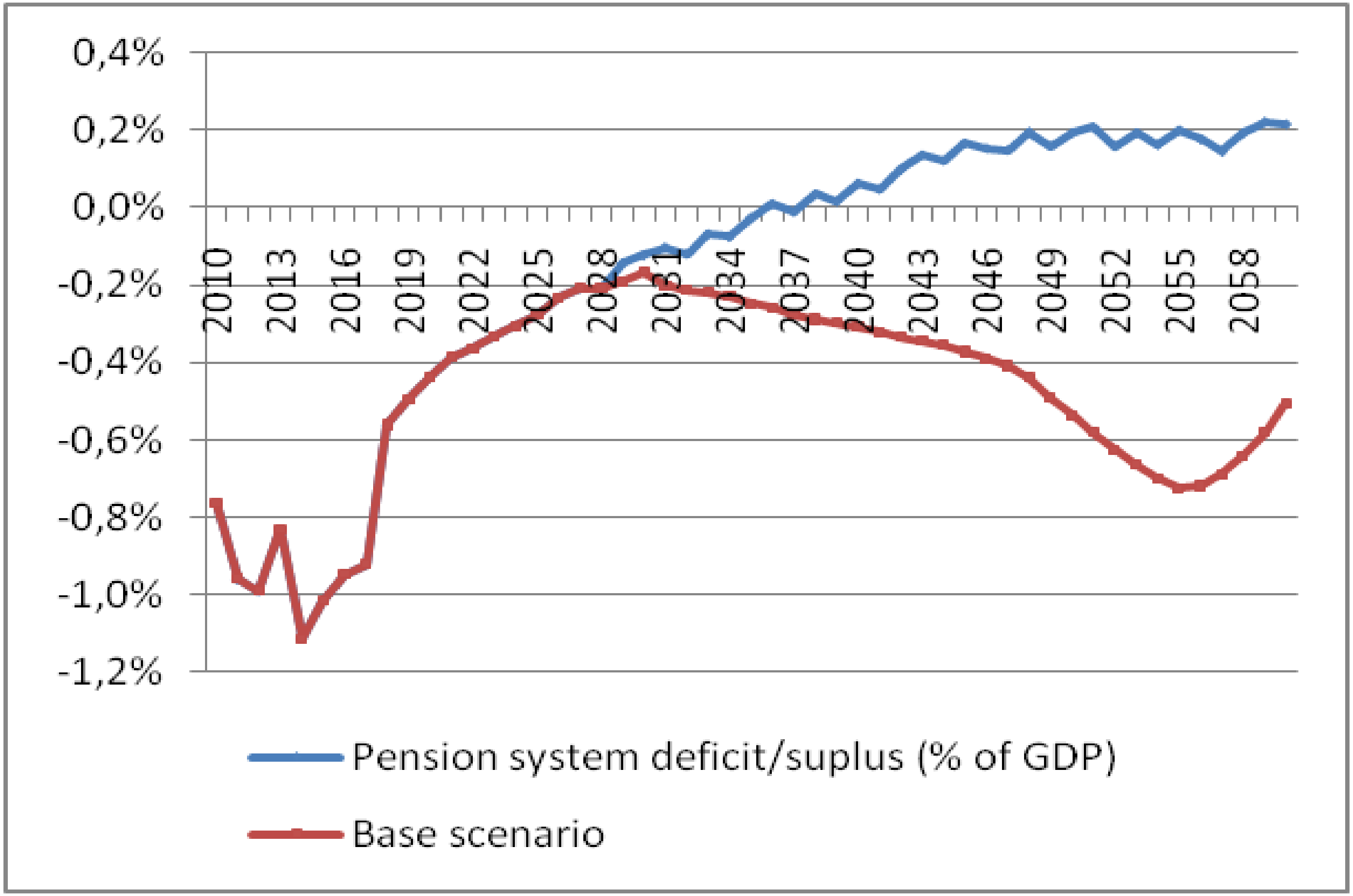

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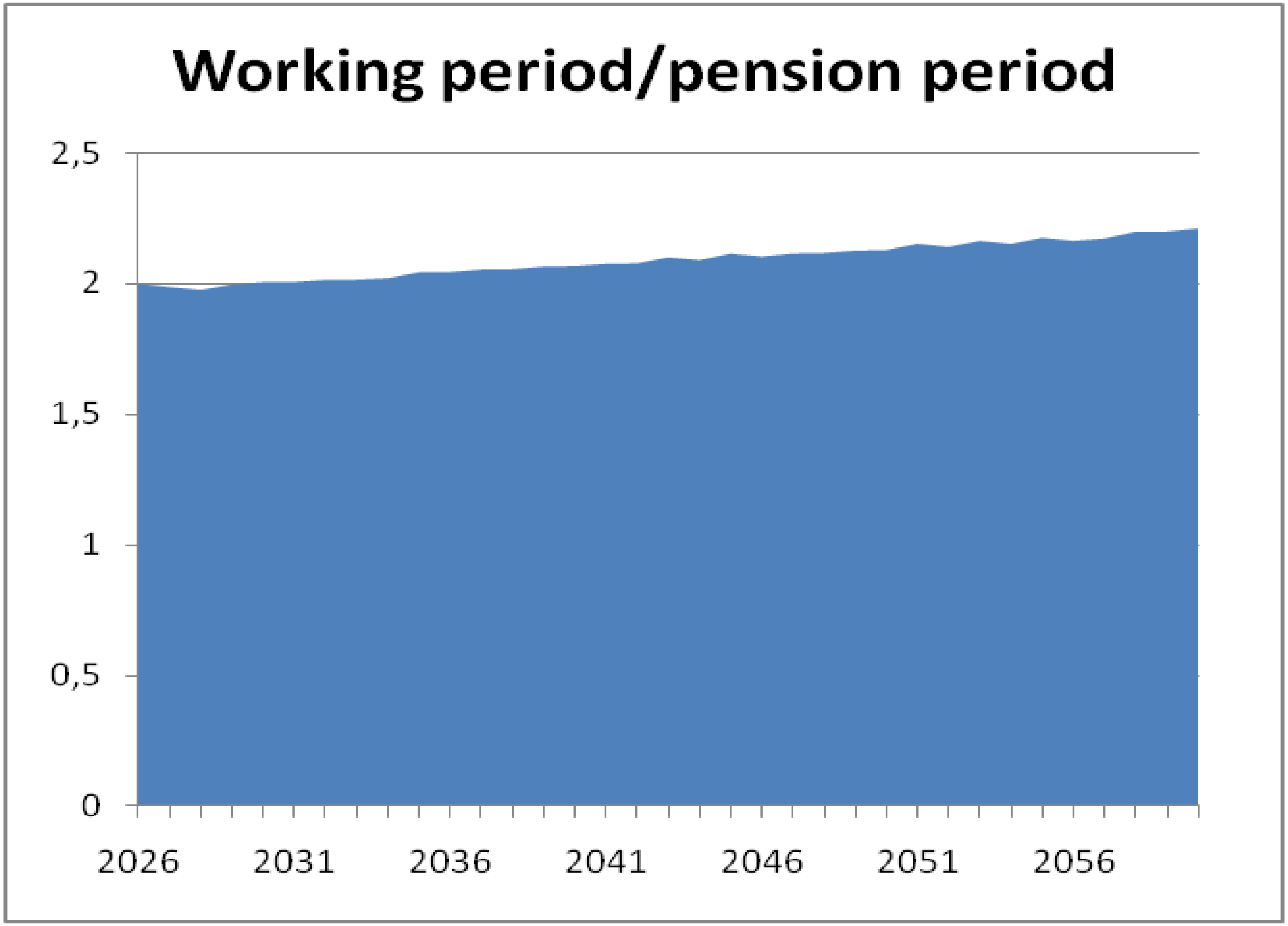

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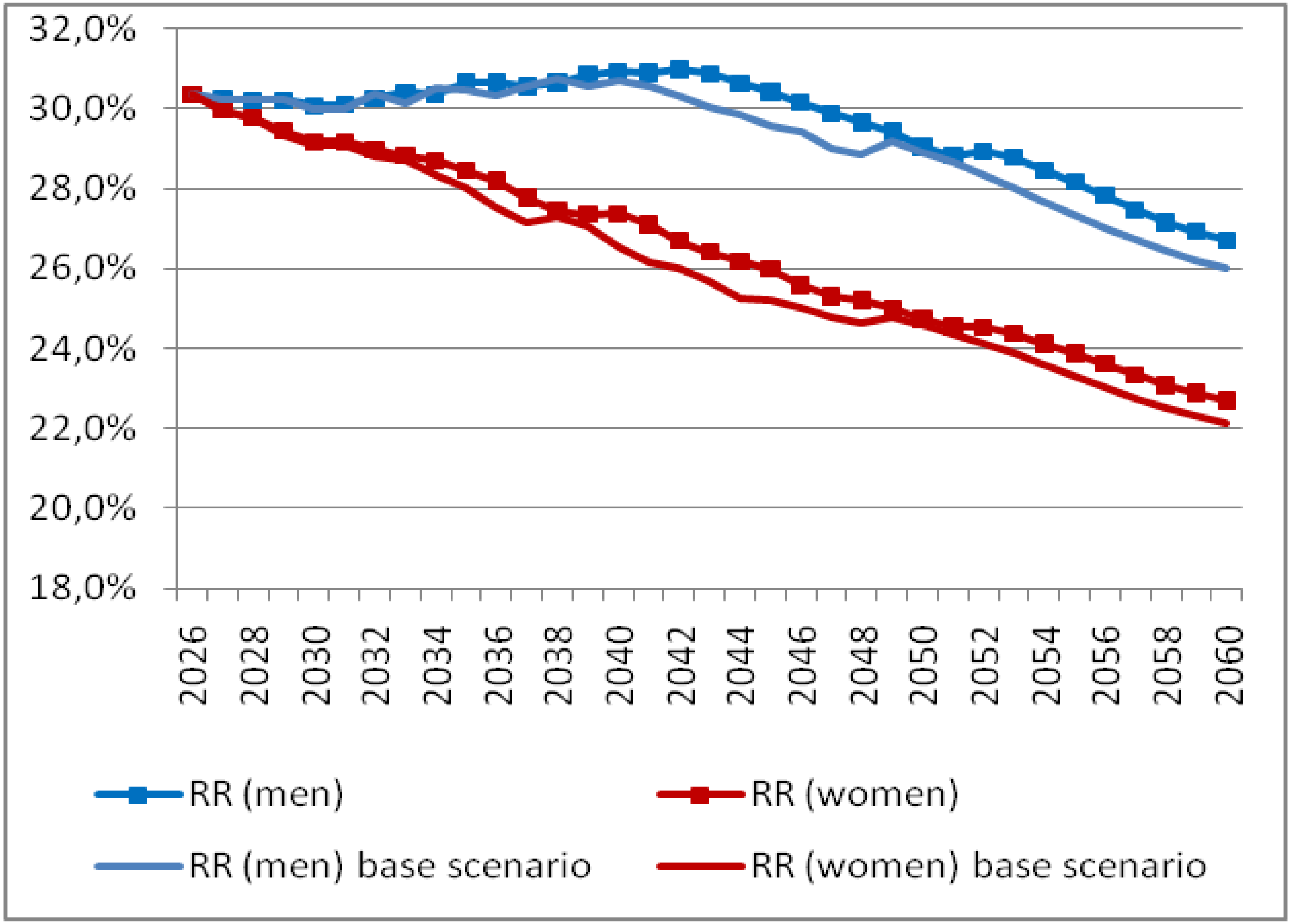


German Pension Formula

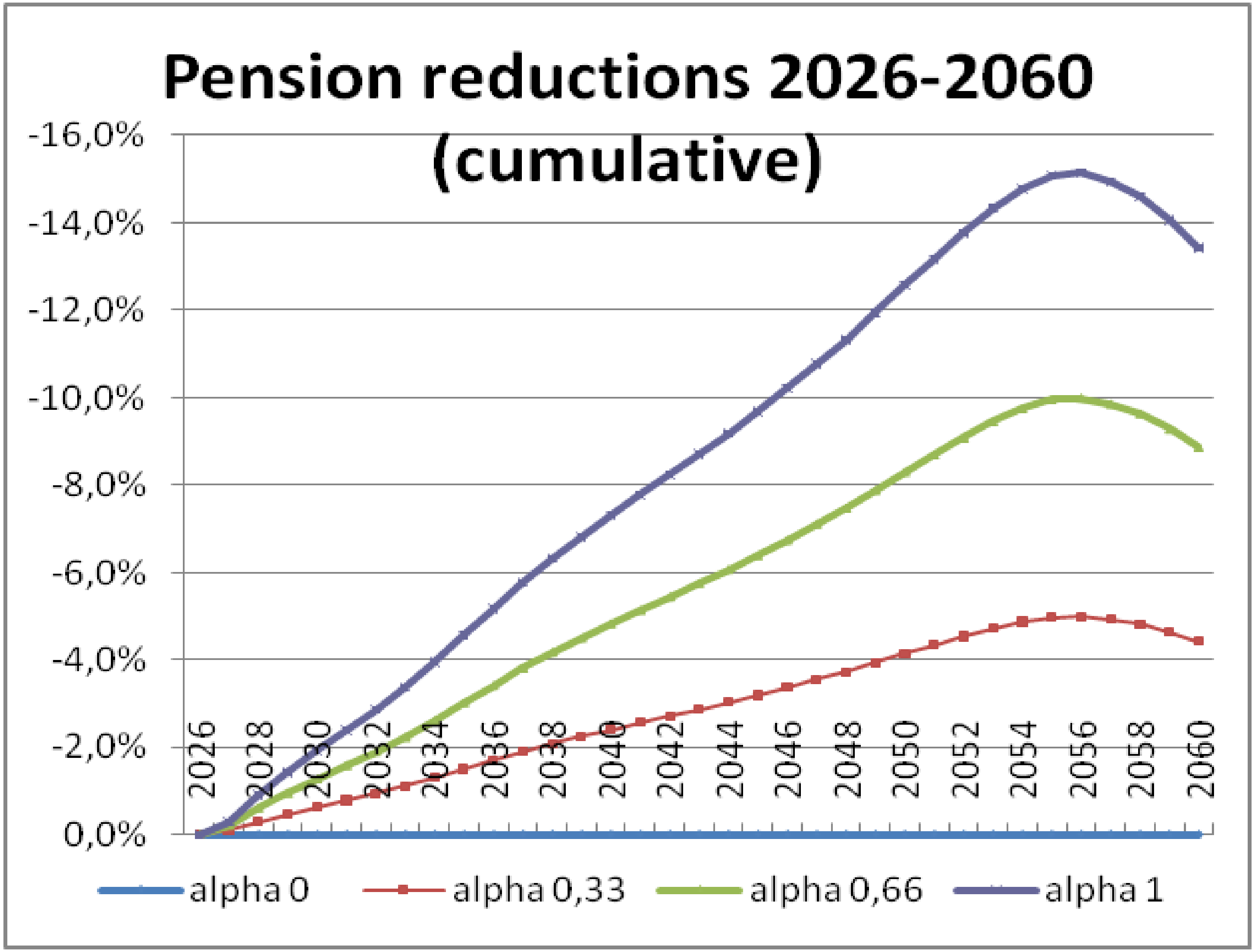
A PAYG pension formula is composed of four factors:

$$PAYG = \frac{number\ of\ pensioners}{number\ of\ contributors} * \frac{average\ pension}{average\ wage}$$

$$\boxed{Pv_t = Pv_{t-1} \times \frac{Anw_{t-1}}{Anw_{t-2}} \times \left[\left(1 - \frac{Pq_{t-1}}{Pq_{t-2}} \right) \times \alpha + 1 \right]}$$

where
PV=pension liability
t=year
Anw= annual contribution income
Pq = number of pensioners / (number of contributors+ number of unemployed)
The sustainability factor is in brackets [].

3. INDEXING BENEFITS FOR THE NUMBER OF PENSIONERS



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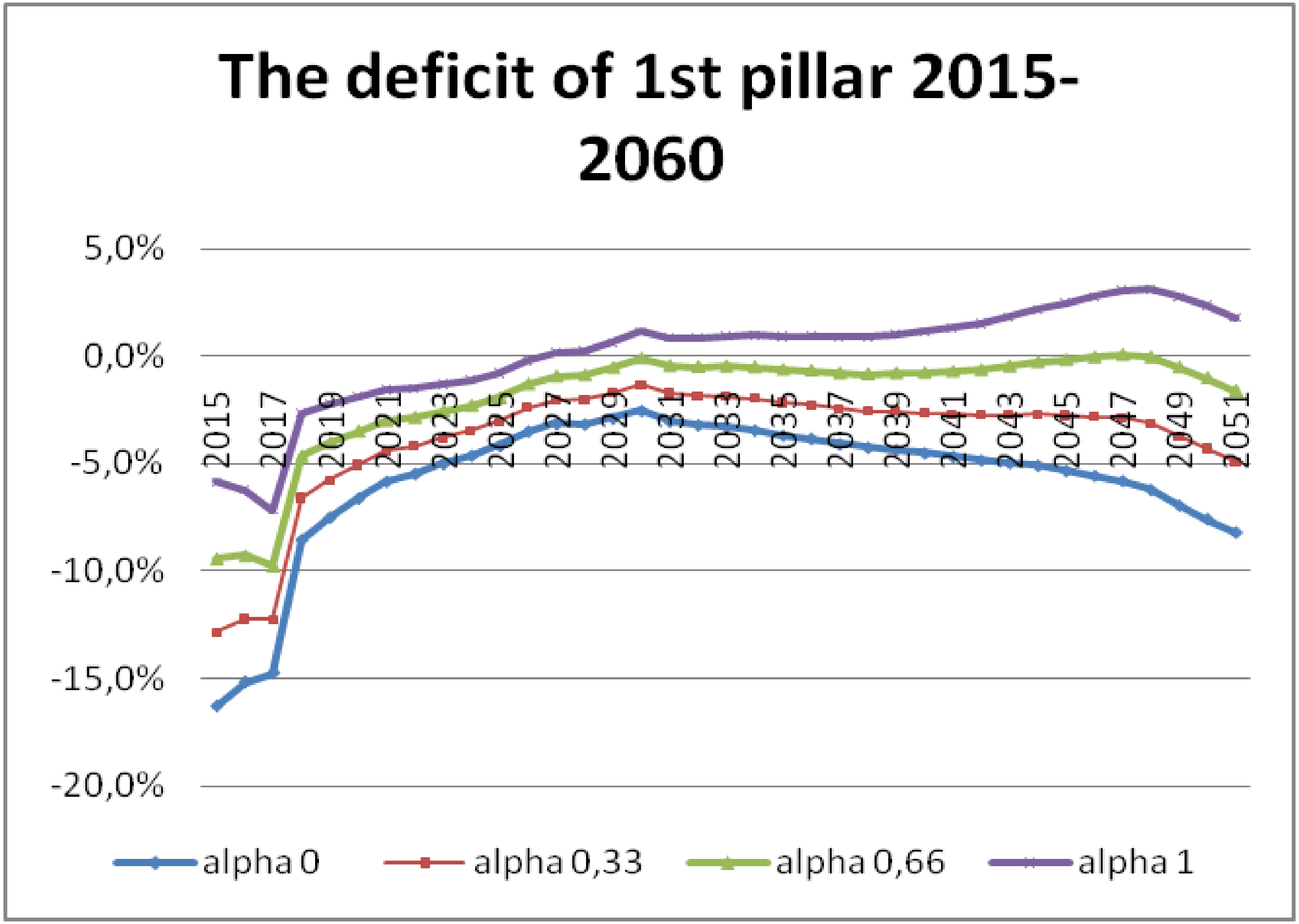
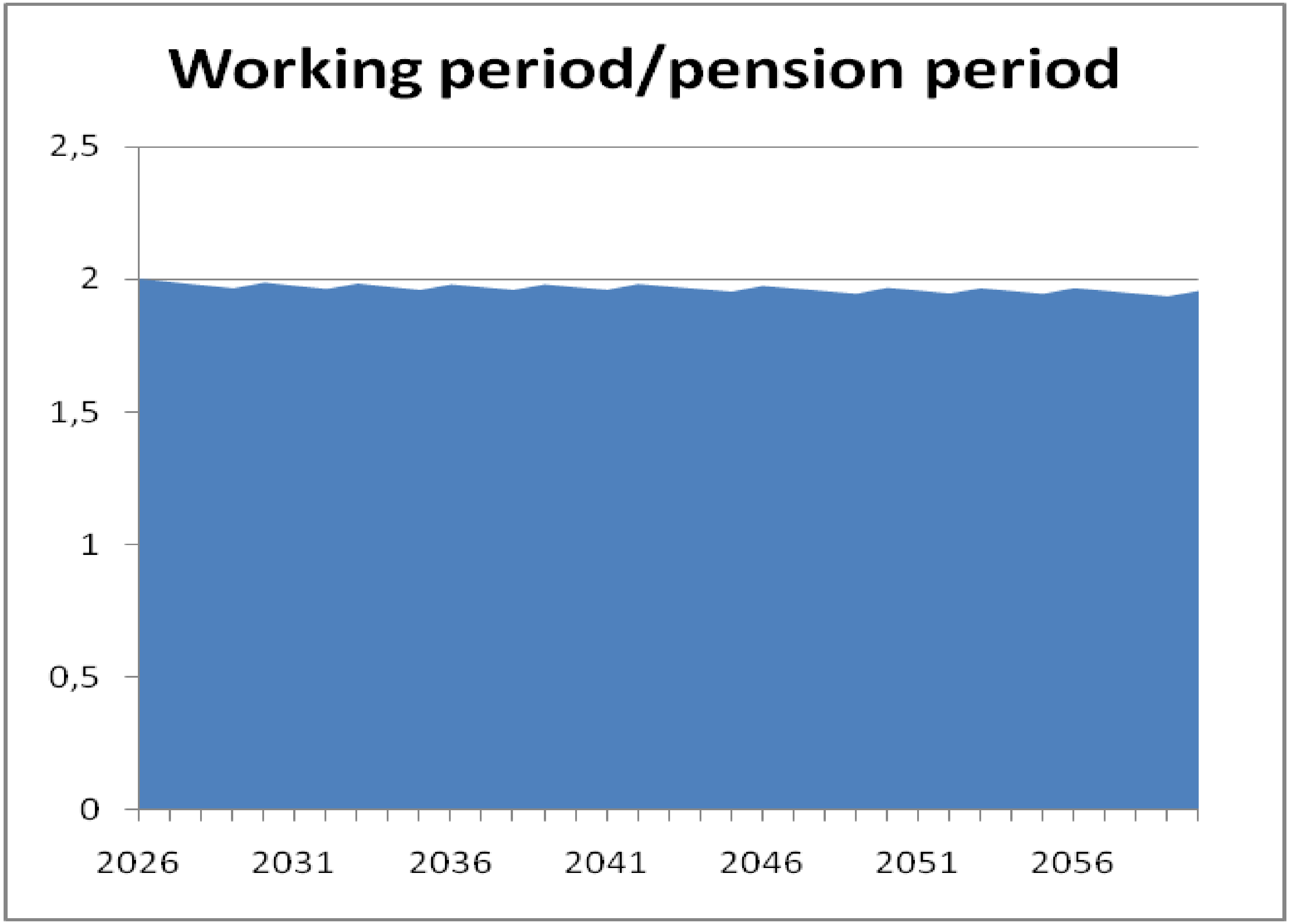


FIXED WORKING PERIOD

- Individual: France (2003) pension reform: the required number of years of contributions to get a full pension will be linked to life expectancy after 2012 (40:20).
- Collective: UK (2005) Lord Turner Committee: the ratio of working years to retirement years would be constant from 2020 after increasing the unisex retirement age to 65.

4. FIXED RELATIONSHIP BETWEEN WORKING AND PENSION PERIOD



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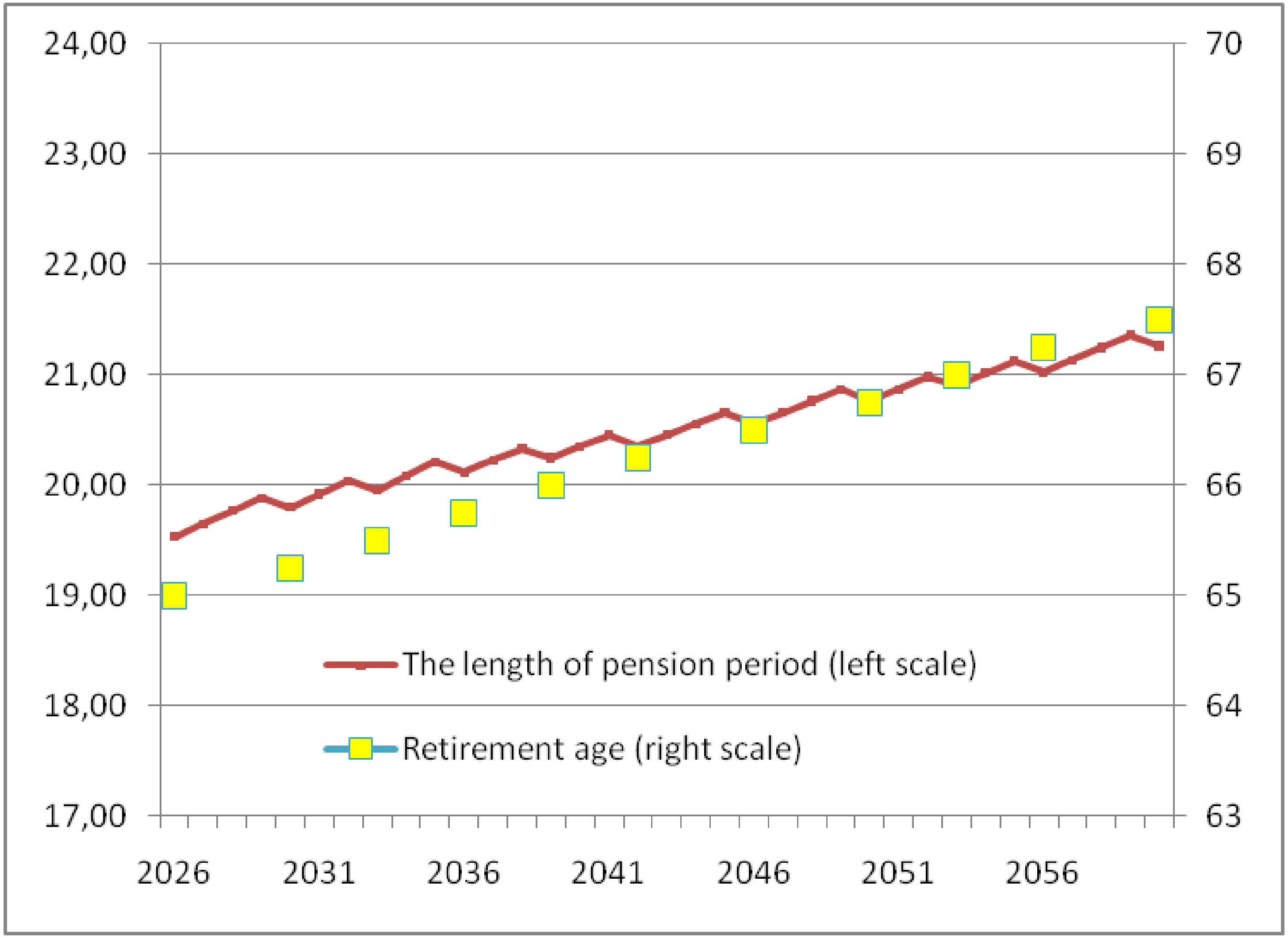

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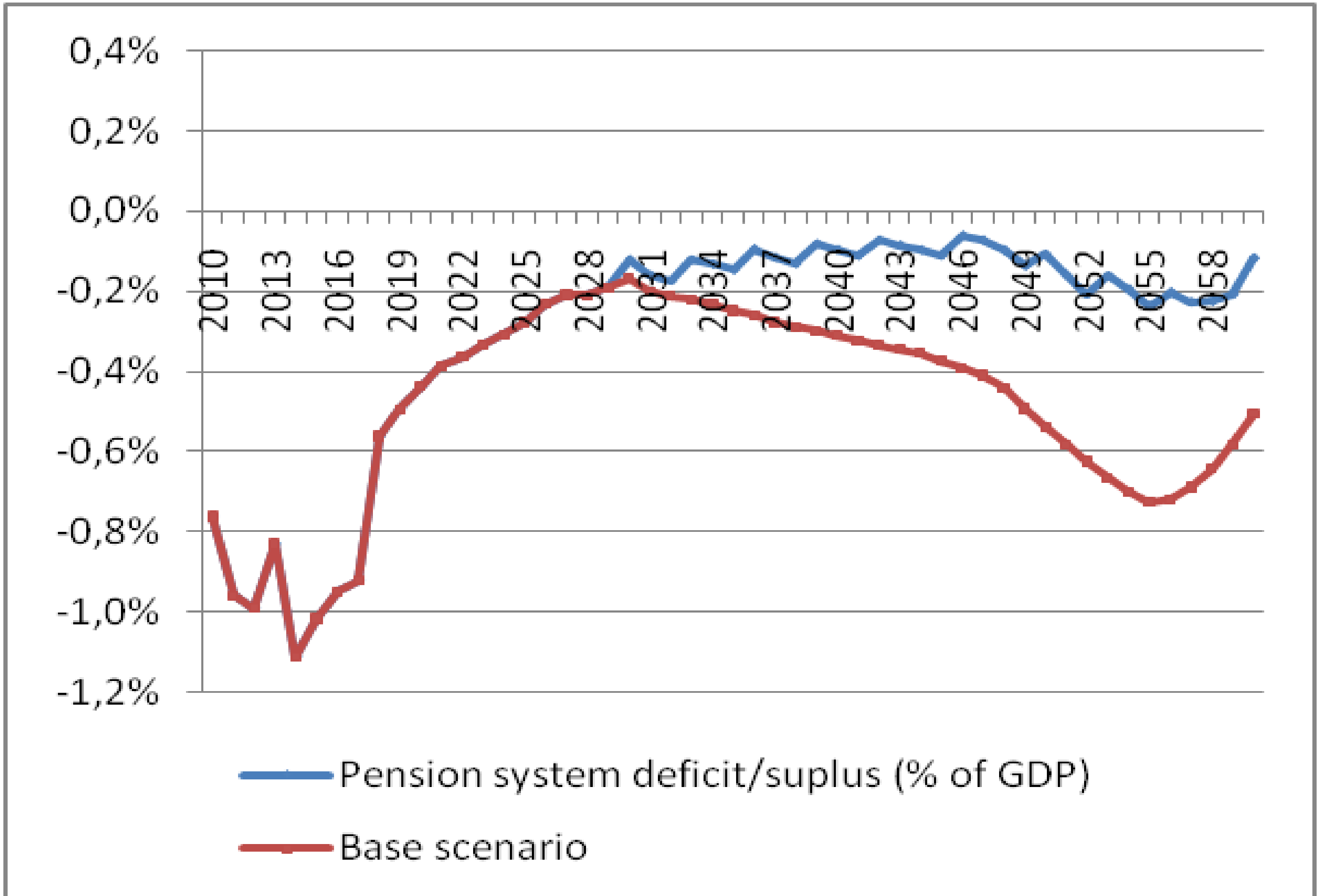

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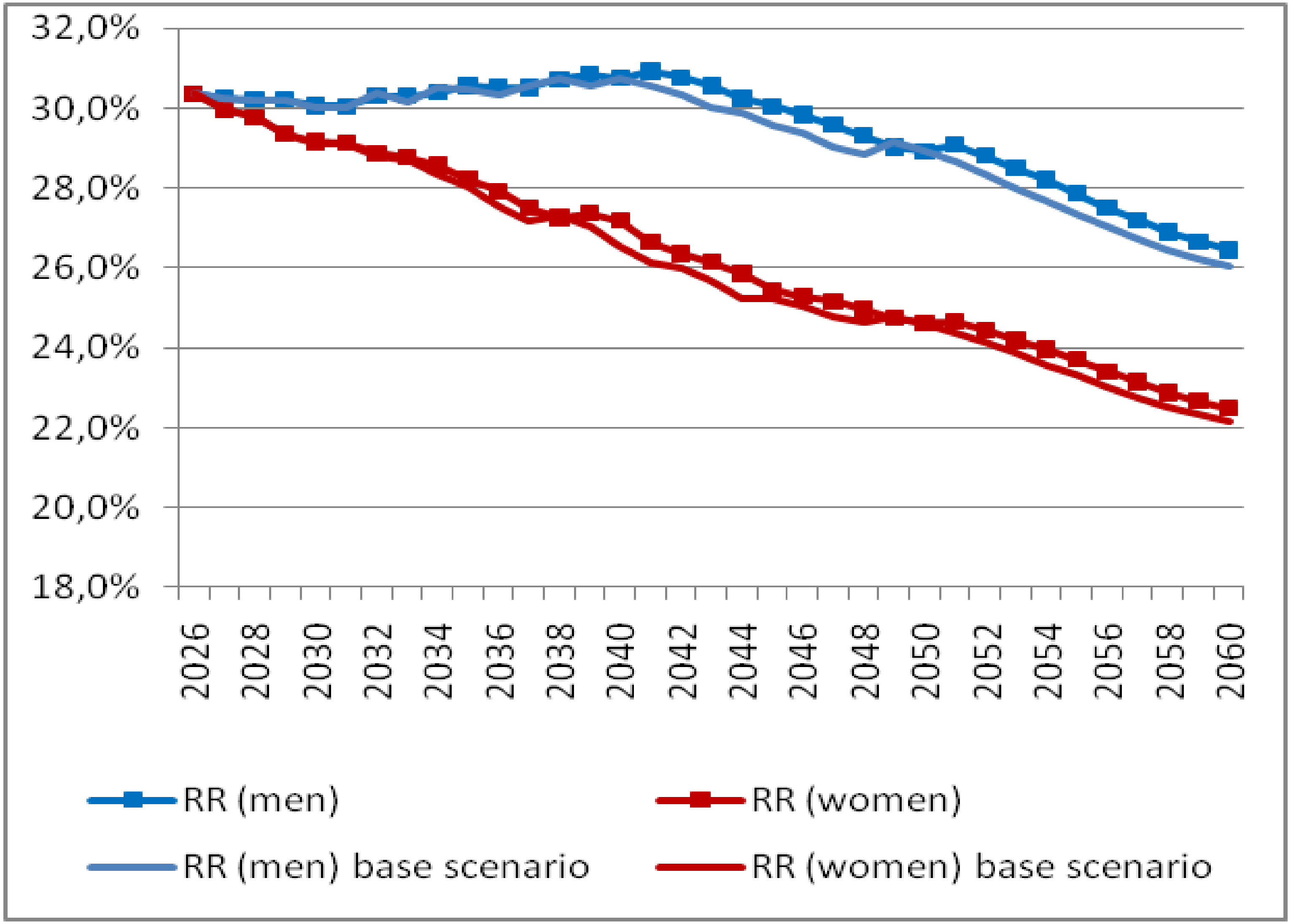
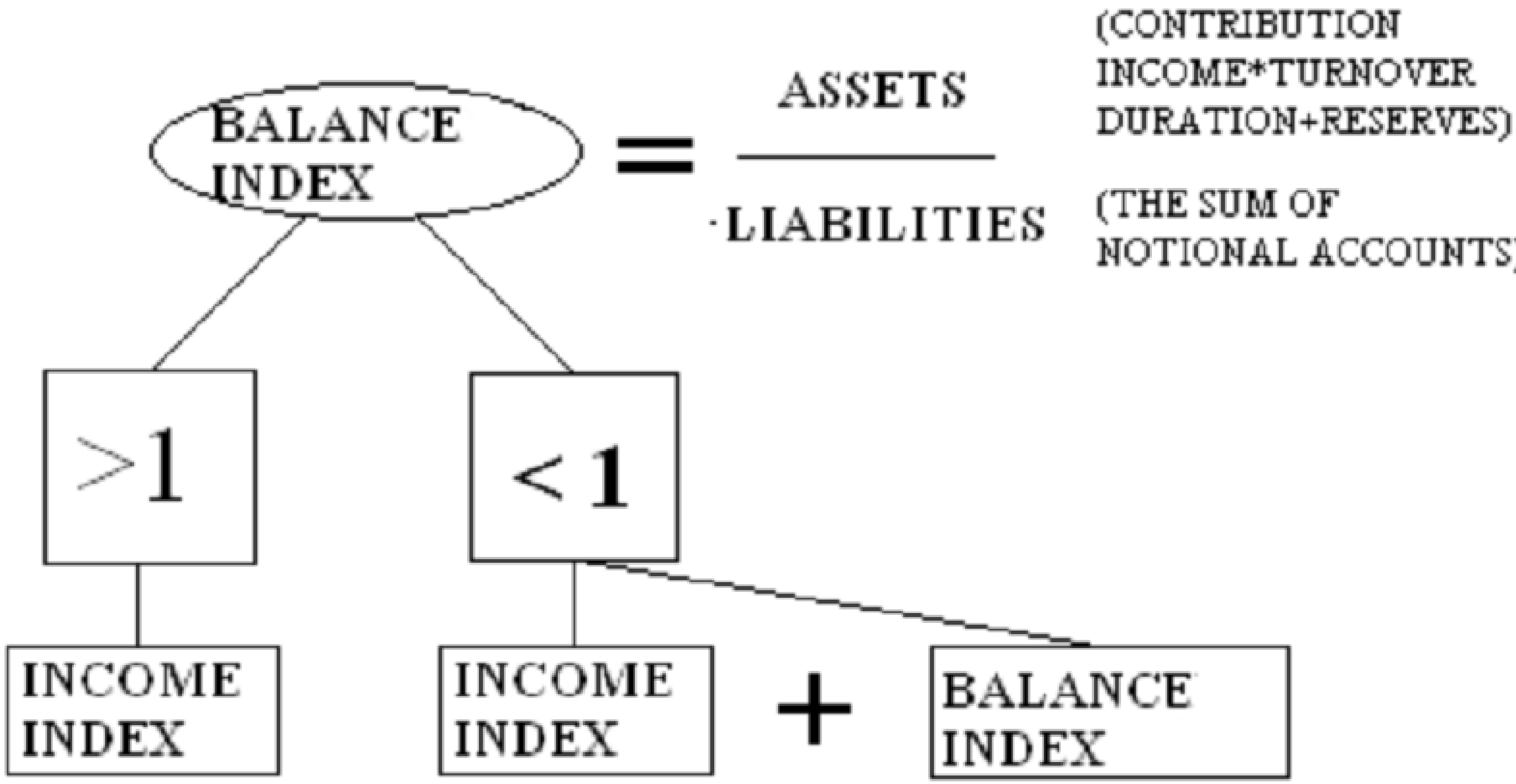


SWEDISH „NDC“ MODEL

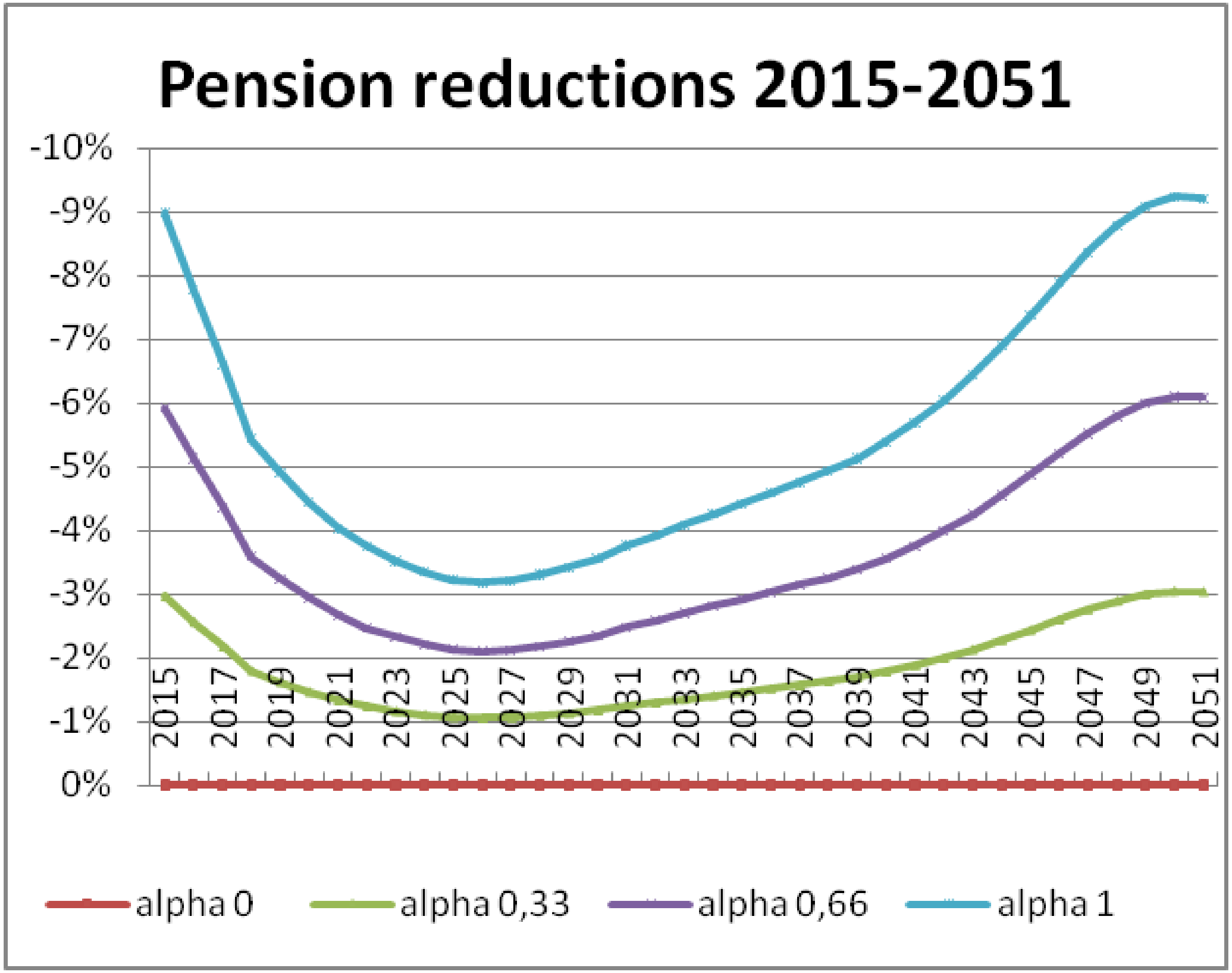
- Settergren (2001):

„the Swedish pay-as-you-go pension system has been designed to be financially stable, i.e. regardless of demographic or economic development it will be able to finance its obligations with a fixed contribution rate and fixed rules for calculating benefits.”

SWEDISH MODEL



5. USING AN ABM FOR CREATING SOLVENCY



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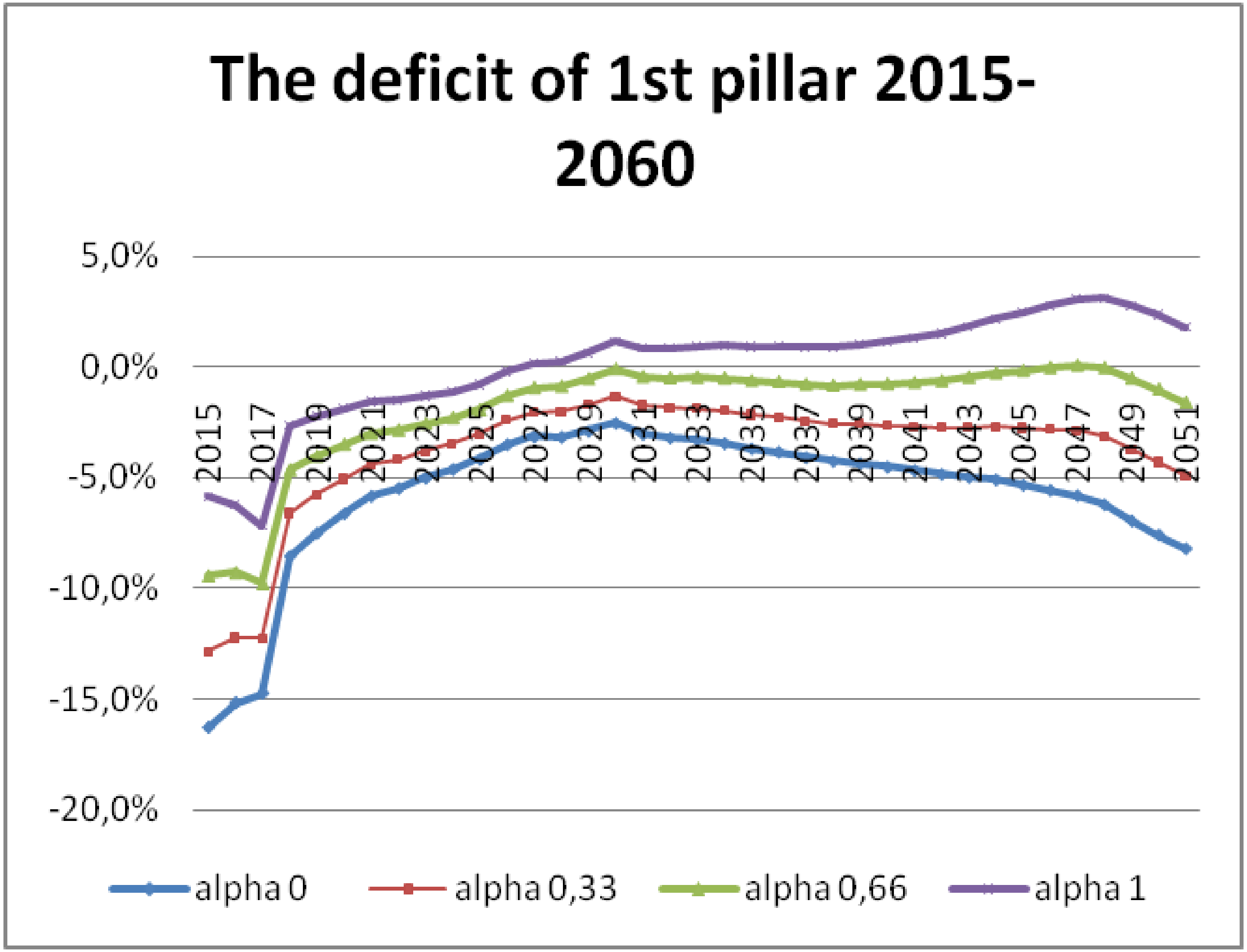

CONCLUSION

- THE PENSION SYSTEM IS FINACIALLY SUSTAINABLE IN THE LONG RUN
- INCREASING PENSION AGE IN LINE WITH LIFE EXPECTANCY IS VERY EFFECTIVE TOOL AGAINST AGEING POPULATION
- INDEXING IS LESS EFFECTIVE TOOL

- BUT: TECHNICAL VERSUS POLITICAL POSSIBILITES

THANK YOU

QUESTIONS?