NATIONAL TRANSFER ACCOUNTS

National accounts and demography change

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Motivation

Motivation

Research questions:

- Slovakia is being one of the fastest aging nations in the EU
- Difference between labour income and consumption
- By employing a simple cohort model, we develop a projection of the trajectory of these two quantities until 2100
- Our analysis of cohort-specific consumption and labour income patterns will show whether labour income will be enough to cover aggregate consumption
- Rebalancing of the ratio of labour income and consumption

Literature

Literature

Methodology and country application:

- **Rolan LEE (1994)** "The Formal Demography of Population Aging, Transfers, and the Economic Life Cycle"
- **The United Nations (2013)**
  National Transfer Accounts Manual: Measuring and Analysing the Generational Economy
- **Istenič, Hammer, Šeme et al. (2016) & Zannella (2017):**
  Metodology guide and detailed description of empirical application on the EU data
- **Patxtot, Rentería & Souto (2015):**
  Development of life cycle deficit in Spain
  Projection indicates significant worsening of $ESR = \frac{\text{labor income}}{\text{consumption}}$ (from 85 % in 2008 to 66 % till 2050)
- **Gál, Vanhuysse & Vargha (2015); Gl, Szabó & Vargha (2015):**
  Pro-elderly welfare states within child-oriented societies
  Comparison of NTA and NTTA

Literature

Savings gap:

- **Gál & Törzsök (2017):**
  The need to generate savings for future consumption.
- **Khoman & Weale (2006):**
  UK Savings Gap; Sufficiency evaluation of savings rates

Using different methodology than NTA:

- **Pomerantz & Weale (2005):**
  UK Savings Gap; Recommendation: setting mandatory saving, change taxation of expenditure and income to avoid extreme decreasing consumption in future.
- **Khoman and Weale (2008):**
  Adequacy of savings in France, Italy, Spain and the UK, when each cohort finances itself

Literature

Consumption (Golden rule consumption):

- **Lee & Mason (2007); Lee & Mason, et al. (2014); Lee, R. (2016)**
  The golden rule consumption - every generation is required to pass consumption-maximizing capital to next generations.

OLG and NTA:

- **Lee & Mason (2010)**
  Overlapping generations (OLG) model
  Human capital investment and economic growth
- Sánchez-Romero, Patxot, Renteria & Souto (2010) and (2013)
- Temple, Rice & McDonald (2017)

Data and Methodology

Methodology

Basic outline for calculation of AGE-PROFILES:

1. Macrocontrols
2. Age-specific averages of different economic categories
3. **Smoothing** procedure by Friedman's SuperSmoother
   (elimination of random variation)
4. **Adjustment** of age-profiles

Methodology

LIFE CYCLE DEFICIT IDENTITY:

$$C(x) - Y^{l}(x) = \tau^{+}(x) - \tau^{-}(x) + Y^{A}(x) - S(x)$$

$C(x) - Y^{l}(x)$ - Life Cycle Deficit (LCD)
$\tau^{+}(x) - \tau^{-}(x)$ - Net transfers (public and private)
$Y^{A}(x) - S(x)$ - Asset-based reallocations

$$C^{f}(a) + C^{g}(a) - Y^{l}(a) = \tau^{inter}(a) + \tau^{intra}(a) + \tau^{g}(a) + Y^{Af}(a) + Y^{Ag}(a) - S^{f}(a) - S^{g}(a)$$

PRIVATE SAVING:

$$S^{f}(a) = Y^{l}(a) + Y^{Af}(a) + Y^{Ag}(a) + \tau^{g}(a) + \tau^{inter}(a) + \tau^{intra}(a) - C(a) - S^{g}(a)$$

LIFE CYCLE ACCOUNT

LABOR INCOME

- Labor earnings and fringe benefits
- Self-employment labor income

CONSUMPTION

Education, health care, long-term care, child care, housing and other

- **Private consumption**
- **Public consumption**

Life cycle deficit

$$LCD = Labor\ income - Consumption$$

PUBLIC AGE REALLOCATION ACCOUNTS

Public transfers, inflow	Public transfers, outflow	Public asset-based reallocations
• Education • Health care • Long-term care • Child care • Housing • Social protection of young, prime-aged and older • Other in-kind and in cash transfers	• Income taxes of individuals and enterprises • Employers payroll taxes • Taxes on property of corporations, households and unincorporated businesses • Goods and services tax • Other taxes on provisions • Other transfers from private to public • Public transfers - deficit	• Public asset income Public property income (inflow & outflow) Public capital income • Public saving

PRIVATE AGE REALLOCATION ACCOUNTS

Private age reallocation accounts

- Private transfers
  - Interhousehold transfers (inflow & outflow)
  - Intrahousehold transfers (inflow & outflow)
- Private asset-based reallocations
  - Private asset income
    - Private property income (inflow & outflow)
      - Corporations
      - Households (imputed interest as inflow; consumer credit as outflow)
    - Private capital income
      - Corporations
      - Owner-occupied housing
      - Share of mixed income
  - Private saving

Data

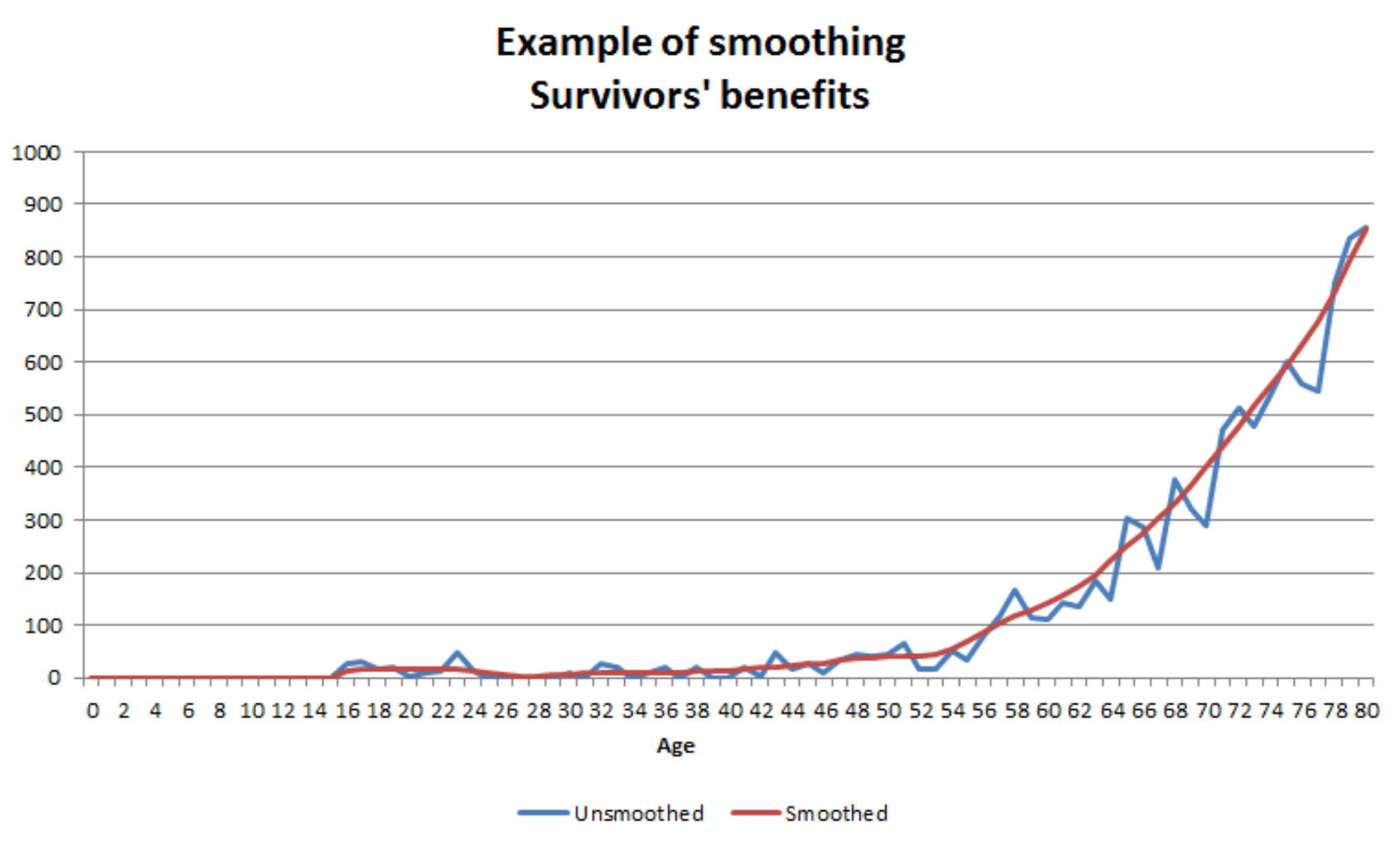
Macrocontrols from **Eurostat data** (National accounts).
Used data for age-profiles from **HBS** & **EU-SILC**:

- **HBS** - household (private) consumption
- **EU-SILC** - labor income, public consumption and transfers

Administrative data:

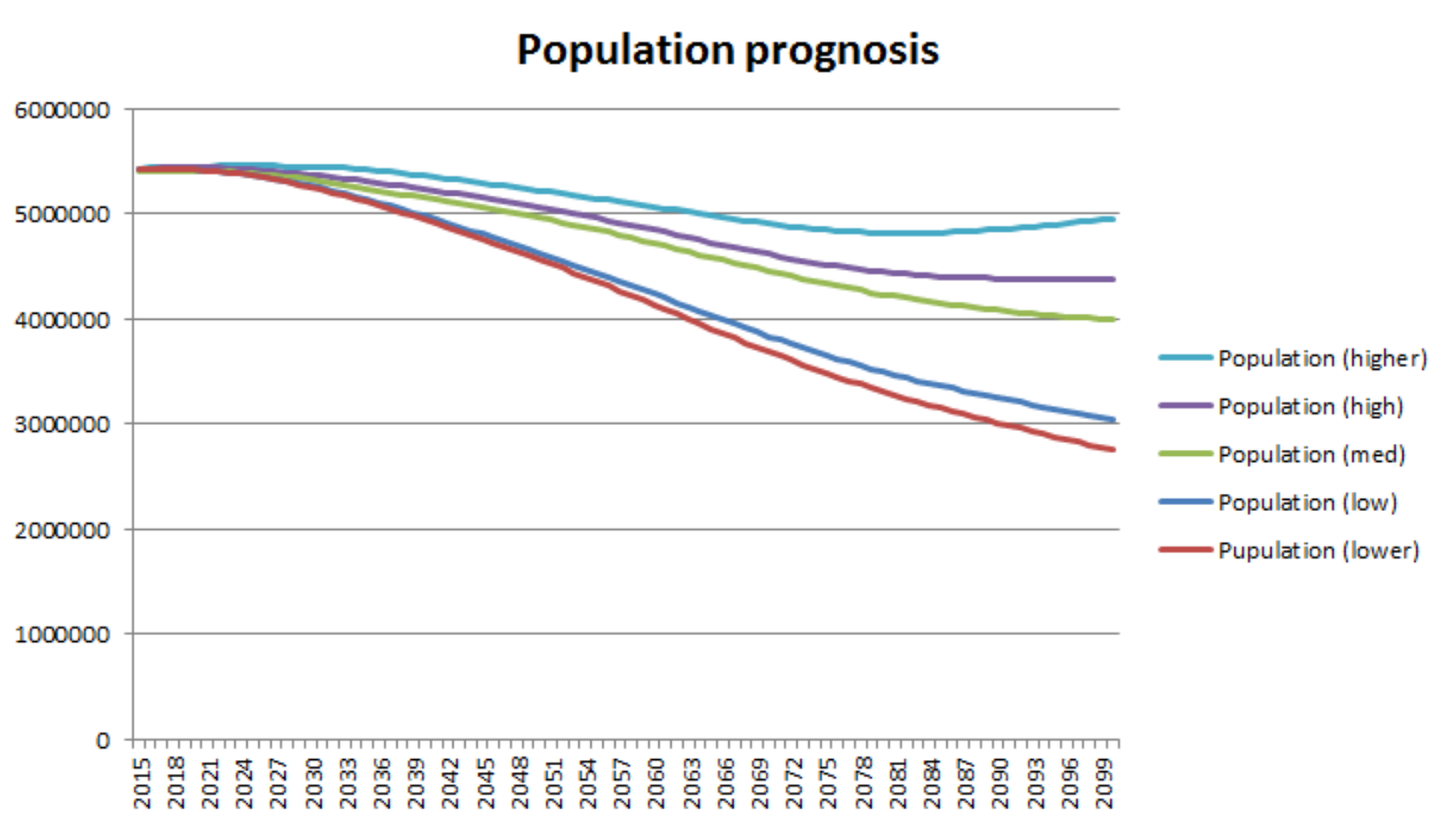
- expenditures on education (IVP)
- public health expenditures (IZP)
- public long-term care expenditures (MPSVaR and ÚPSVaR)

Smoothing & Adjustment factor

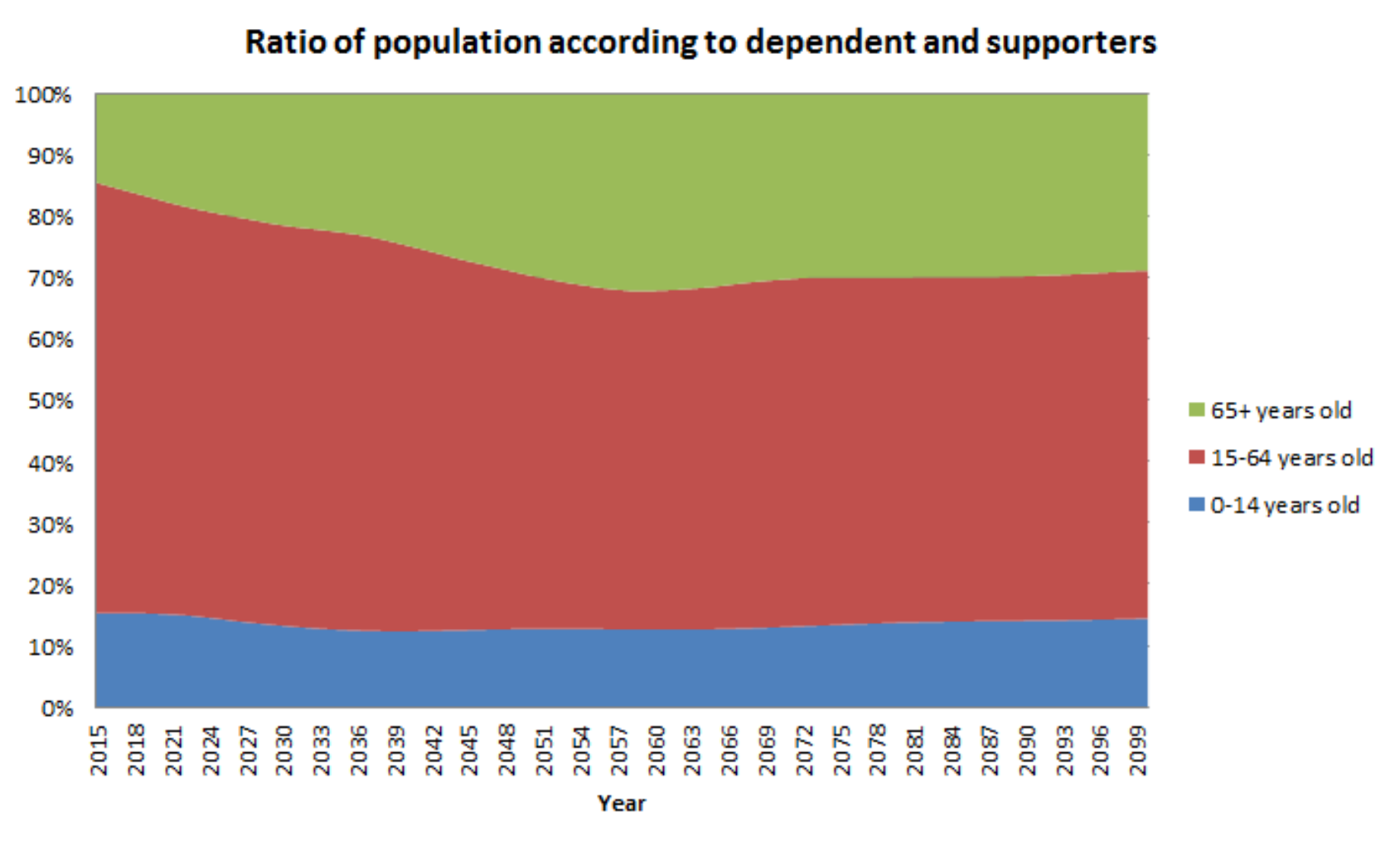


Population

Data


Population prognosis
6000000
5000000
4000000
3000000
2000000
1000000
0
2015
2018
2021
2024
2027
2030
2033
2036
2039
2042
2045
2048
2051
2054
2057
2060
2063
2066
2069
2072
2075
2078
2081
2084
2087
2090
2093
2096
2099
Population (higher)
Population (high)
Population (med)
Population (low)
Pupulation (lower)

Data

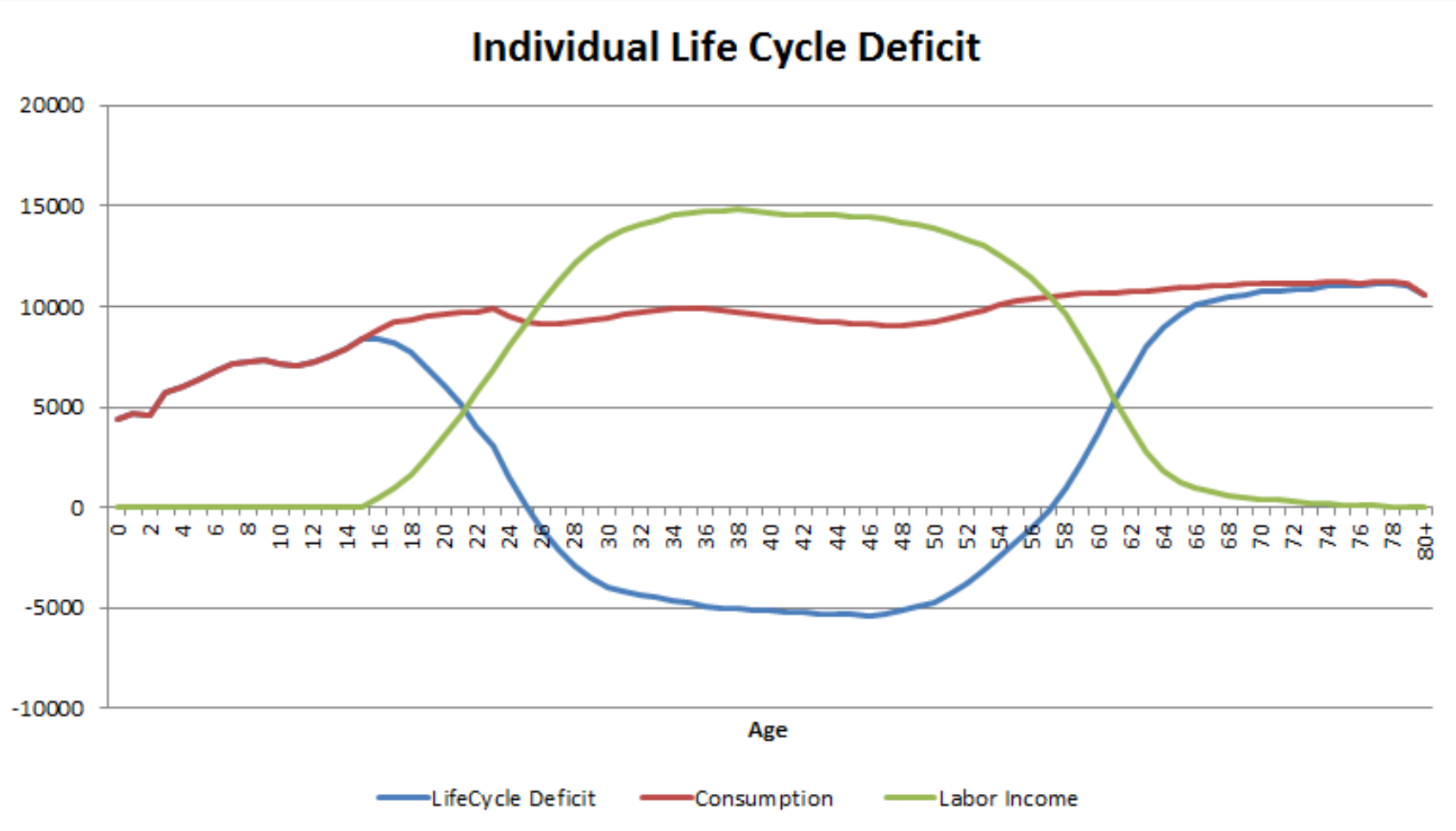

Ratio of population according to dependent and supporters
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2015
2018
2021
2024
2027
2030
2033
2036
2039
2042
2045
2048
2051
2054
2057
2060
2063
2066
2069
2072
2075
2078
2081
2084
2087
2090
2093
2096
2099
Year
65+ years old
15-64 years old
0-14 years old

Data

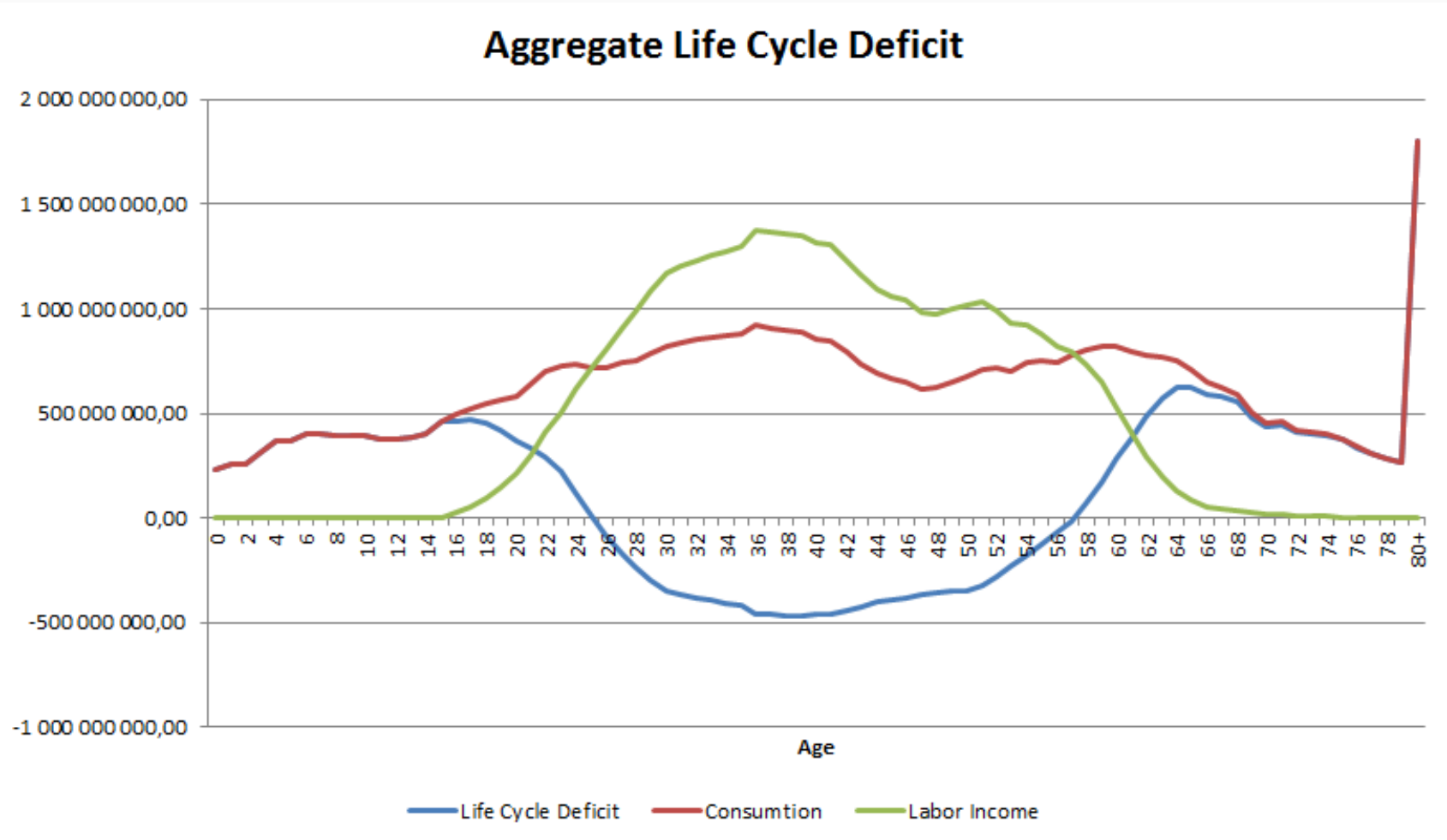
Population age-composition
Population size
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100+
Age
2015
2050
2100

Results

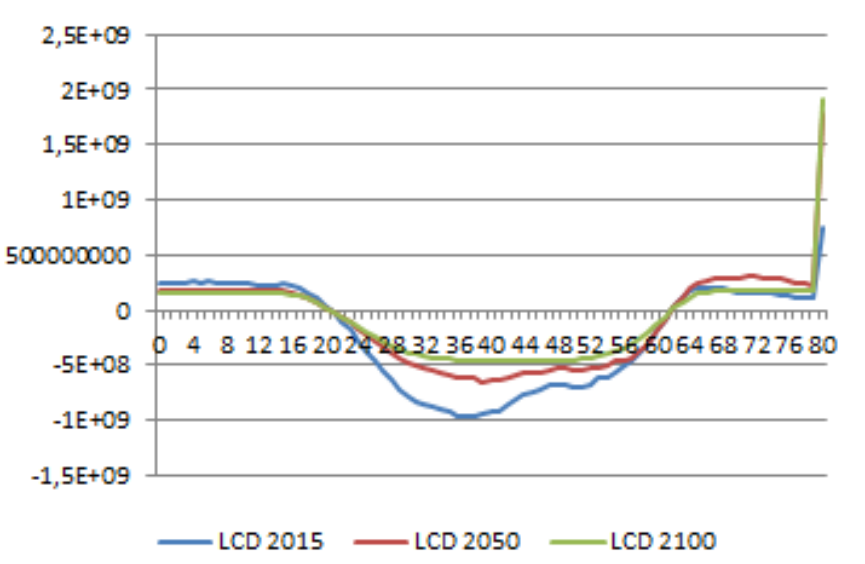
Results

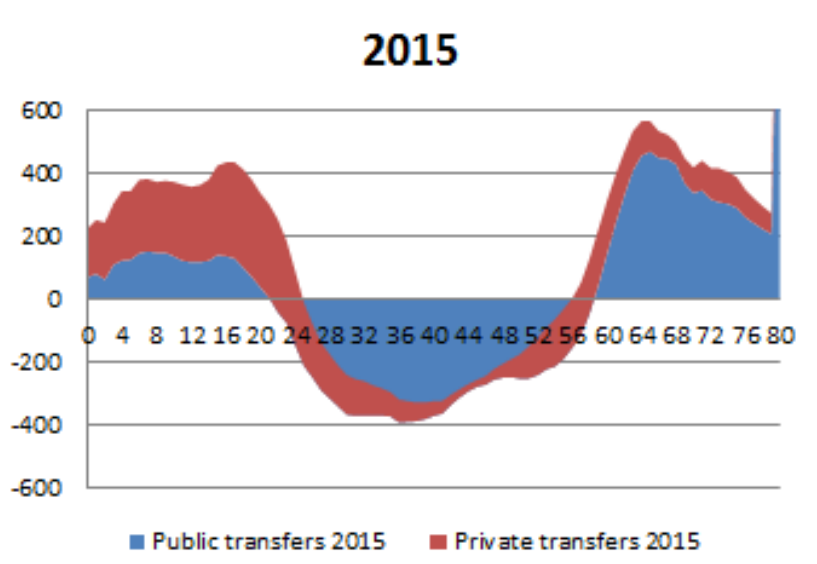

Individual Life Cycle Deficit
20000
15000
10000
5000
0
-5000
-10000
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80+
Age
LifeCycle Deficit
Consumption
Labor Income

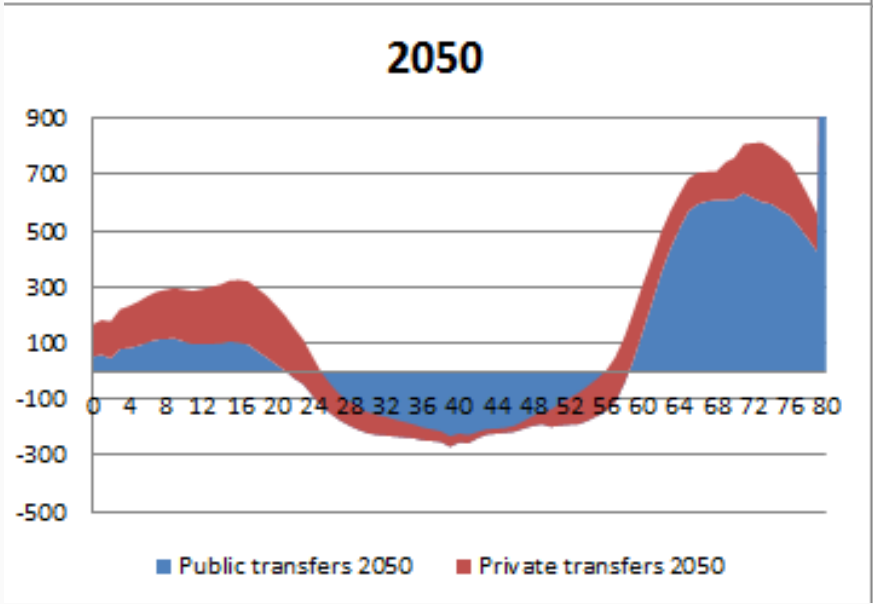
Results

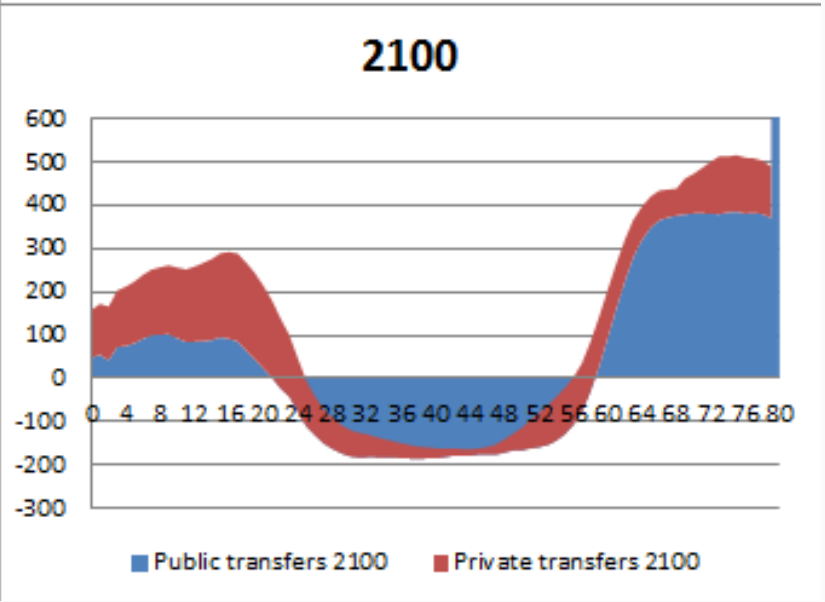

Aggregate Life Cycle Deficit
2 000 000 000,00
1 500 000 000,00
1 000 000 000,00
500 000 000,00
0,00
-500 000 000,00
-1 000 000 000,00
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80+
Age
Life Cycle Deficit
Consumtion
Labor Income

Results


2,5E+09
2E+09
1,5E+09
1E+09
500000000
0
-5E+08
-1E+09
-1,5E+09
0 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80
LCD 2015
LCD 2050
LCD 2100


2015
600
400
200
0
-200
-400
-600
0 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80
Public transfers 2015
Private transfers 2015

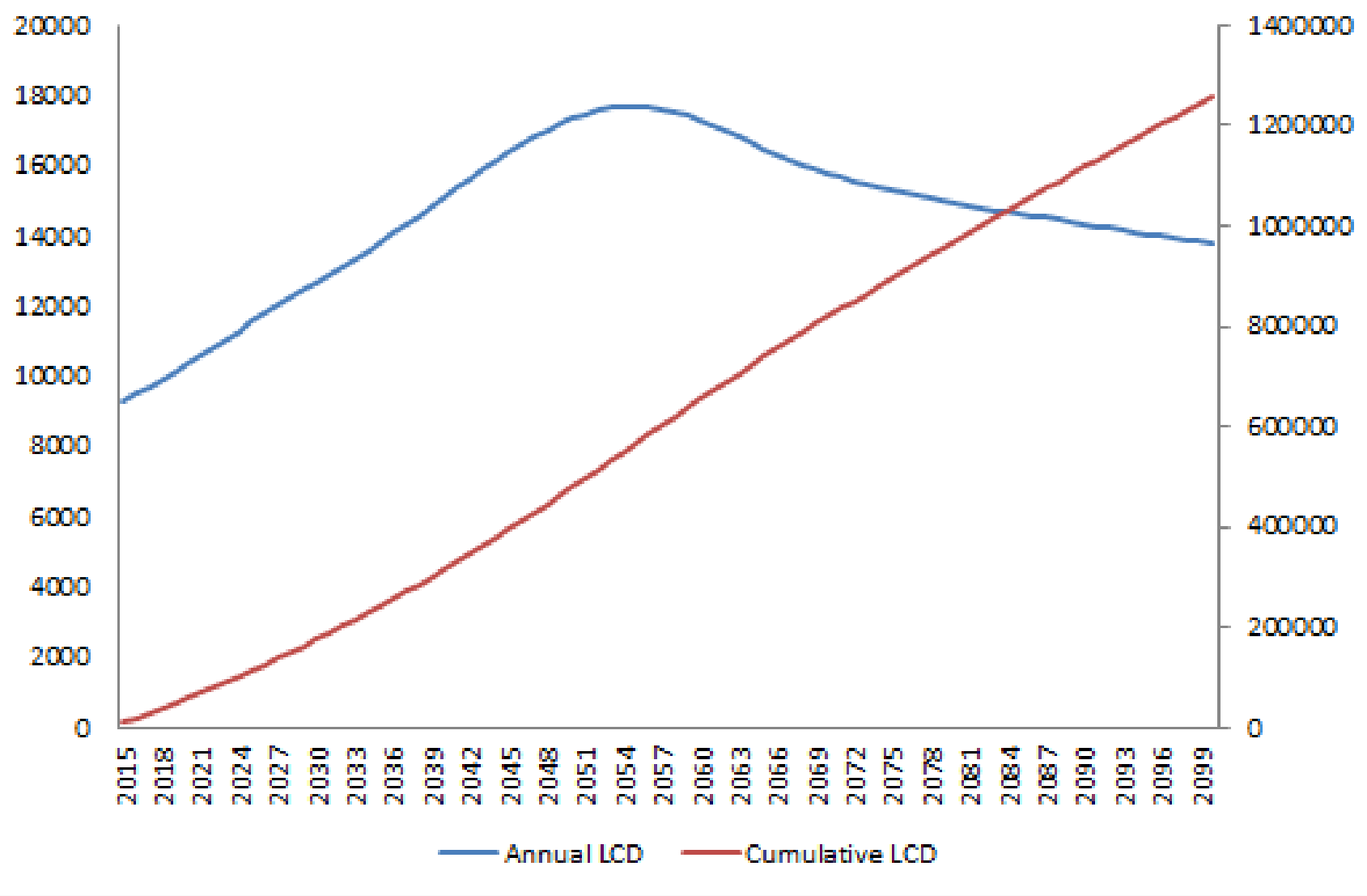

2050
900
700
500
300
100
-100
-300
-500
0 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80
Public transfers 2050
Private transfers 2050


2100
600
500
400
300
200
100
0
-100
-200
-300
0 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80
Public transfers 2100
Private transfers 2100

Scenarios

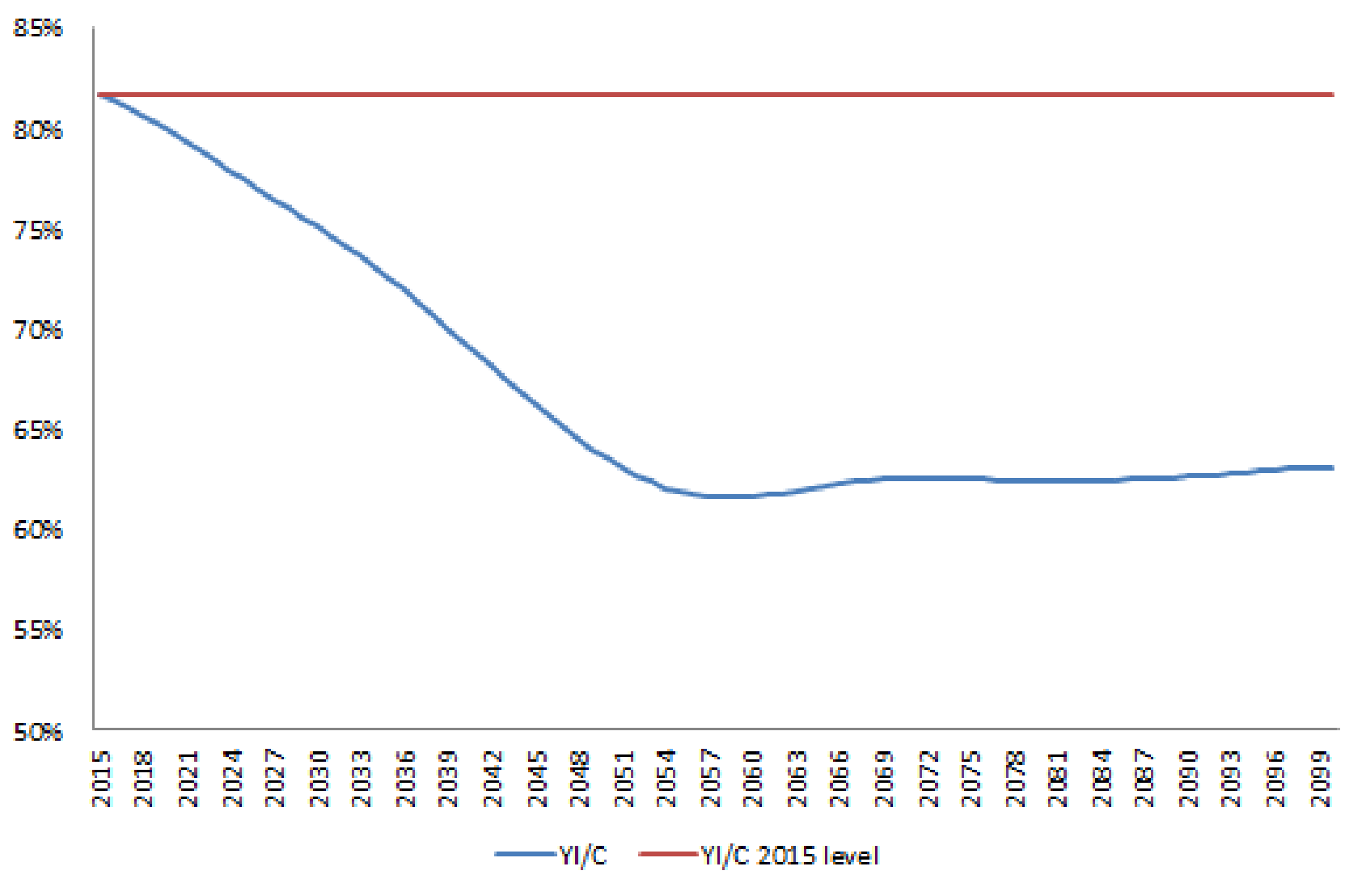
Demographic change

NO productivity growth, NO depreciation, NO inflation



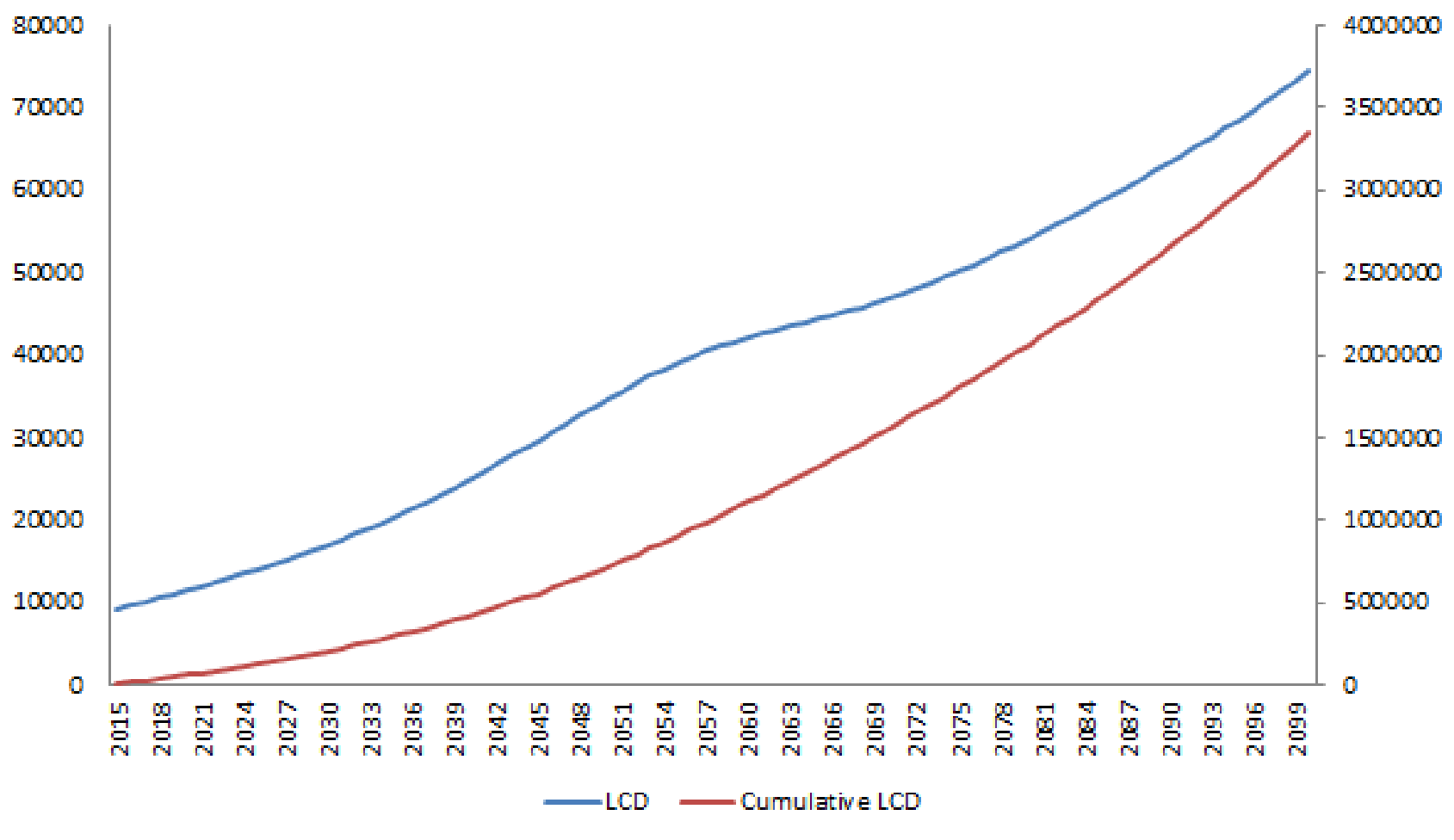
Demographic change

NO productivity growth, NO depreciation, NO inflation



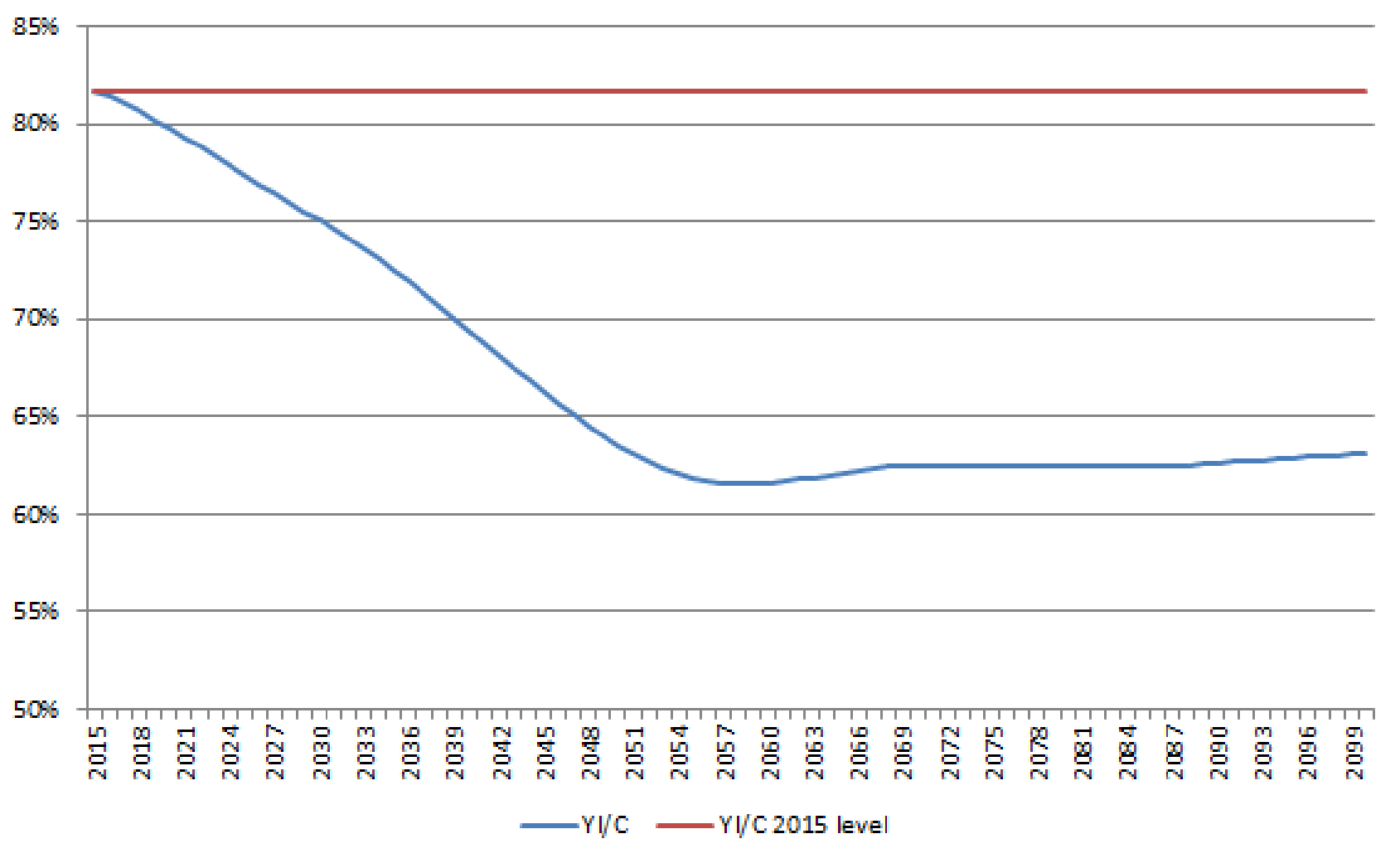
Demographic change

✓productivity growth 1 %, NO inflation



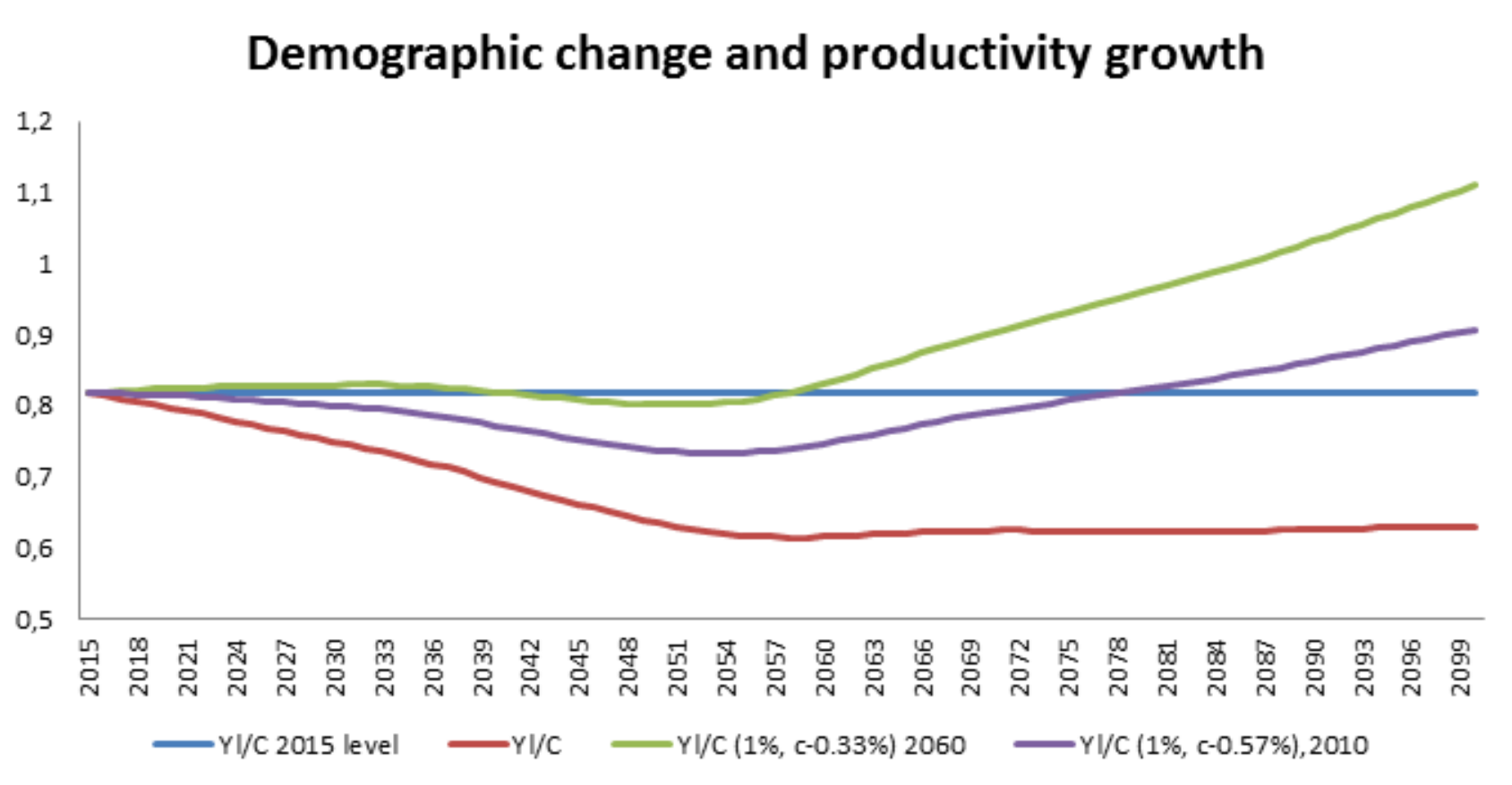
Demographic change

✓productivity growth 1 %, NO inflation



Optimization scenario

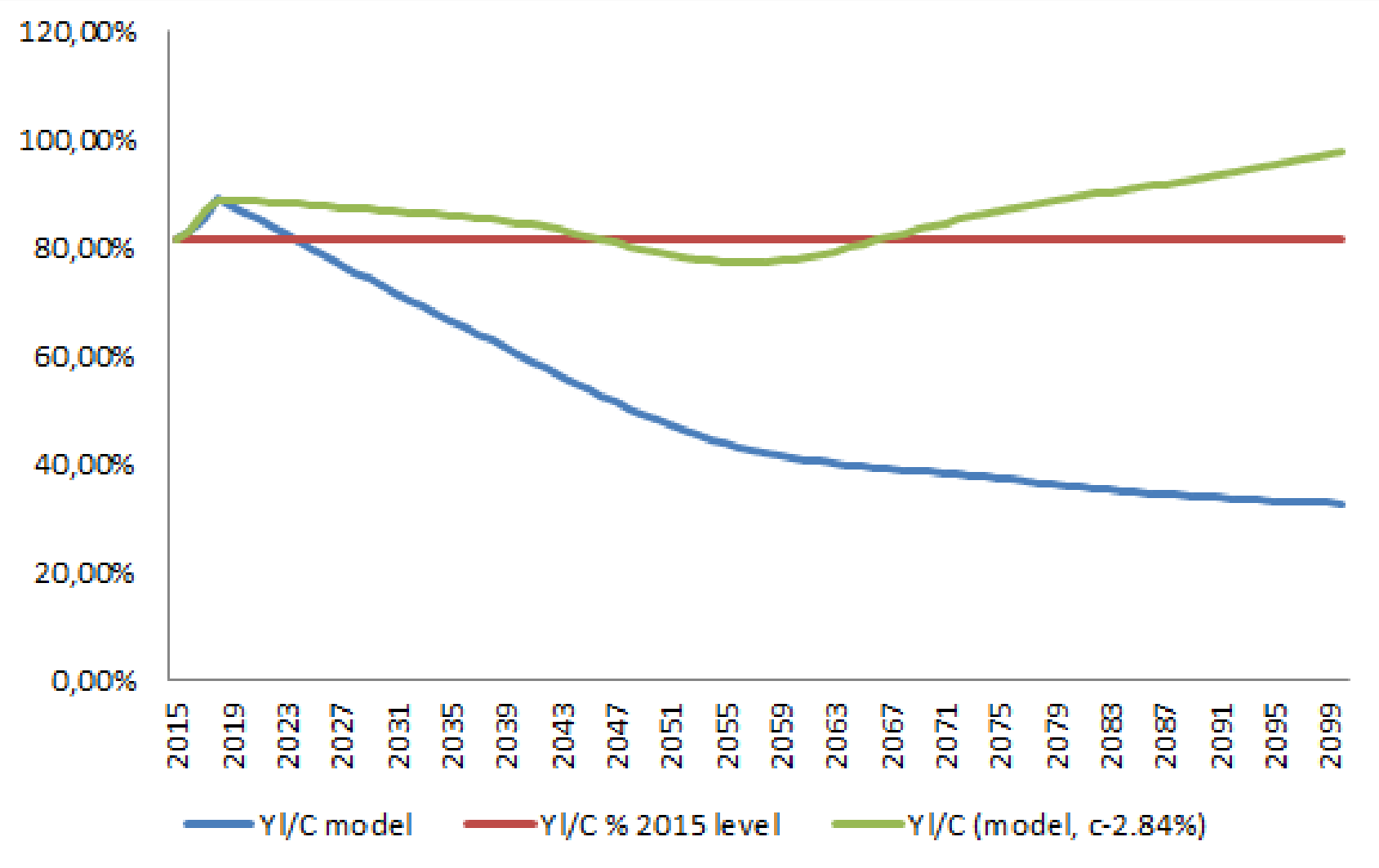
✓productivity growth, NO inflation



	Productivity growth	Consumption growth
Y^l/C	1 %	0,33 %
	2 %	1,32 %
	3 %	2,32 %

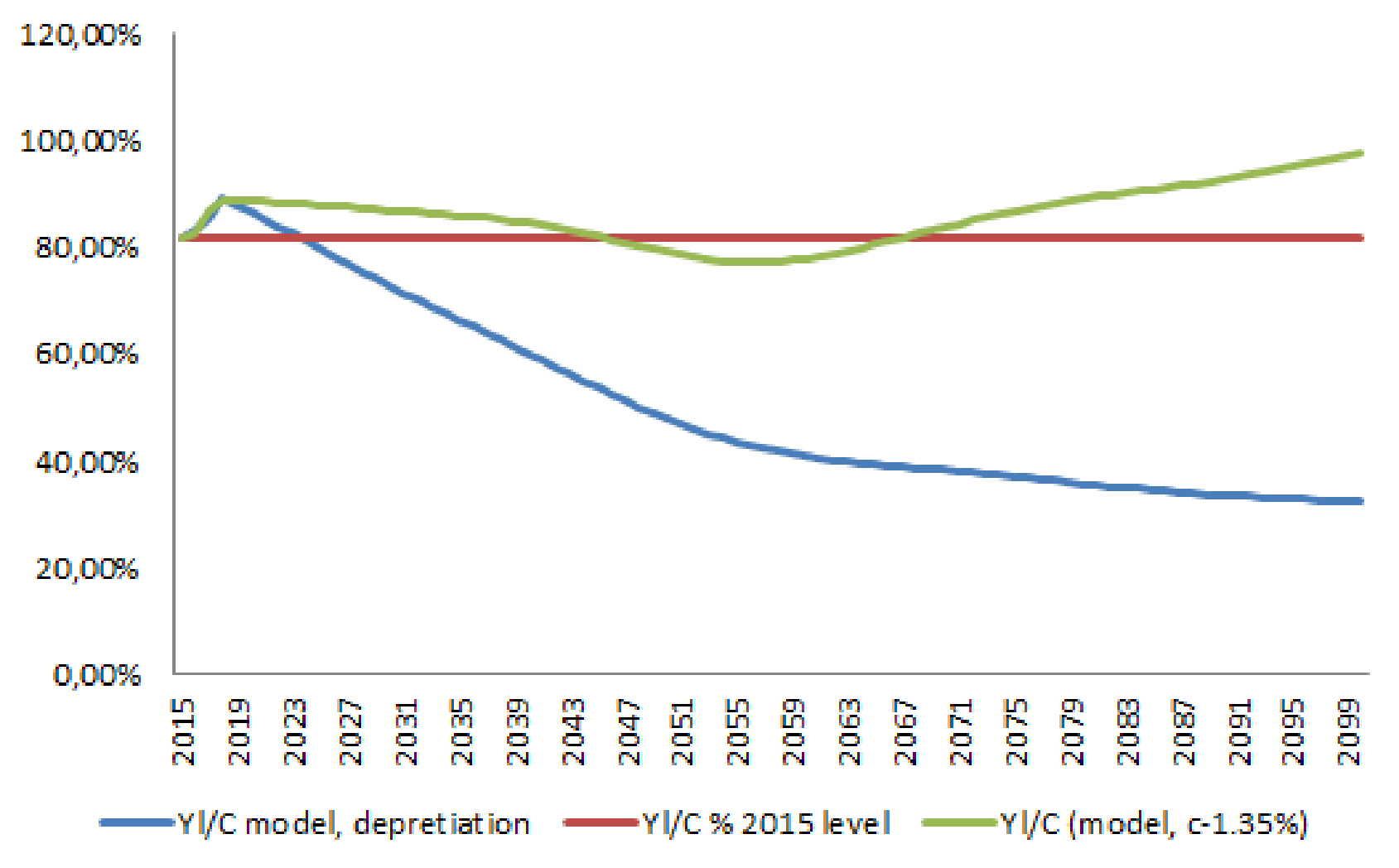
Model SLMM

✓productivity growth, NO depreciation, NO inflation



Model SLMM

✓productivity growth, ✓depreciation 1,5 %, NO inflation



Conclusion

Summary

- Life cycle deficit in Slovakia is in young ages financed mostly by private transfers and in old age by public transfers
- The effects of the demographic change on the labour consumption ratio revealed significant increasing from 2015 by 2060 and then the effect of ageing wear out and the ratio remains constant until 2100
- Rebalancing might be achieved by 0.7 pp lower consumption growth then the increase of per capita labour income (productivity growth)

Future research

1. National Time Transfer Accounts (NTTA)
2. Inequality and NTA
3. Multi-pillar pension system in NTA
4. Formalized model of the NTA

Questions?

The End

Thank you for your attention!

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