The Effect of Population Ageing on Pension System in Belarus

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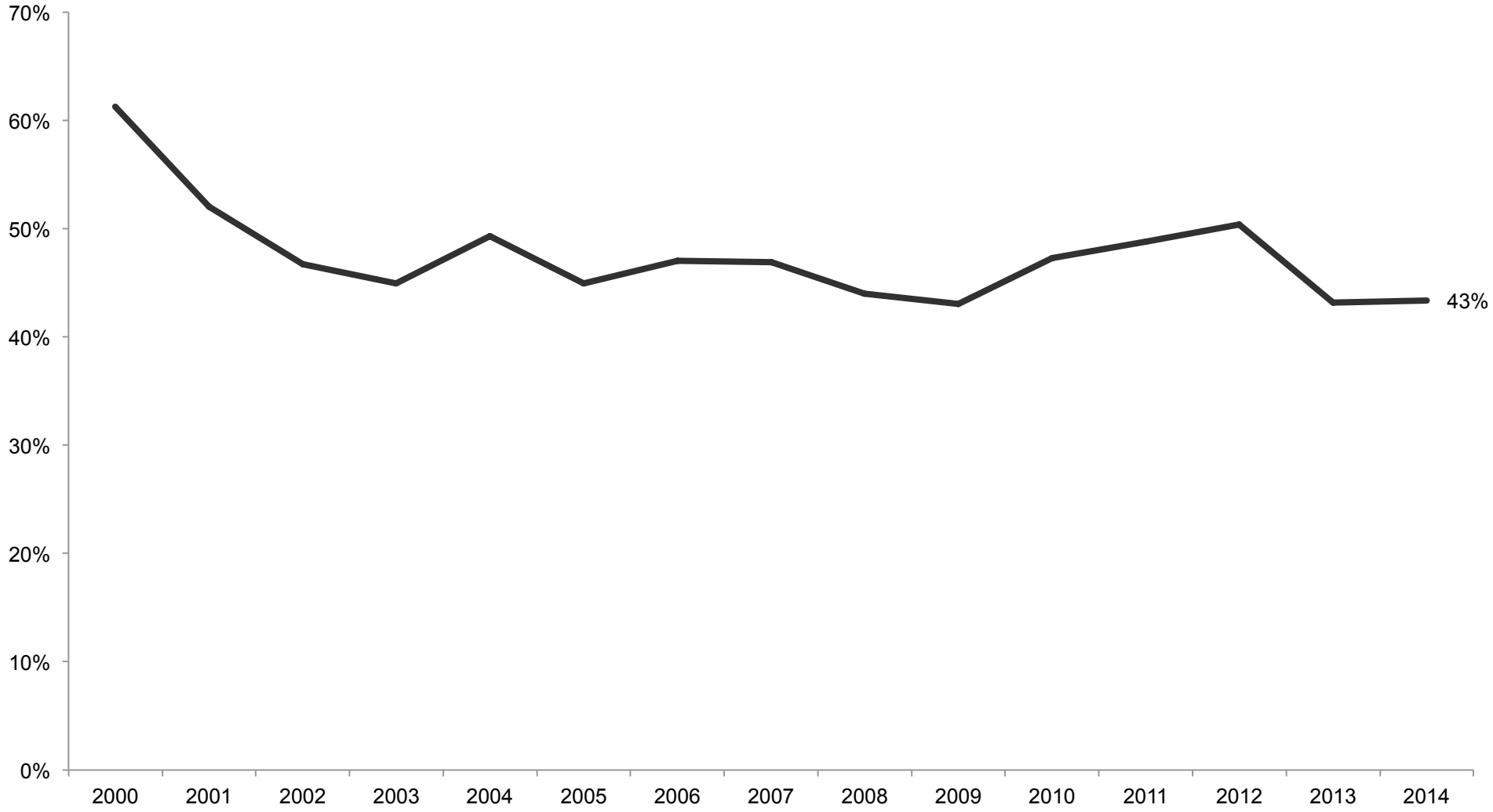
Overview

- Introduction
- Model
- Results
- Conclusions

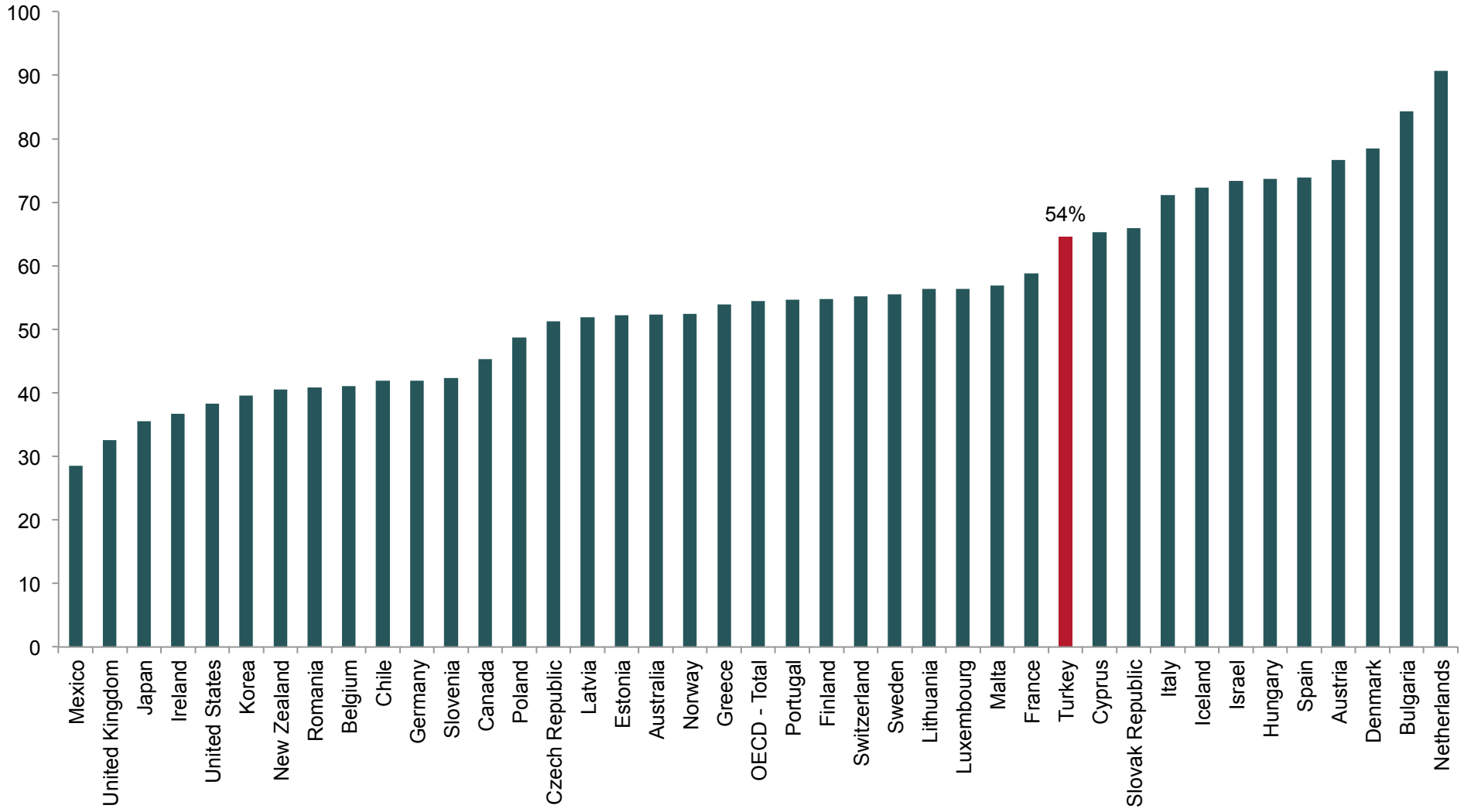
Context

- Belarus has a relatively generous pension system
  - State pension age 55/60 for females/males
  - Contributions: 1% by employee and 28% by employer – 22.7% of total cost of labour
  - Replacement rate – around 45-50%
- Belarus has a rapidly ageing population
- Maintaining pension system with its current configuration will become impossible in the future

Replacement rate (ratio of average pension to average wage)



Replacement rate, OECD countries, 2012

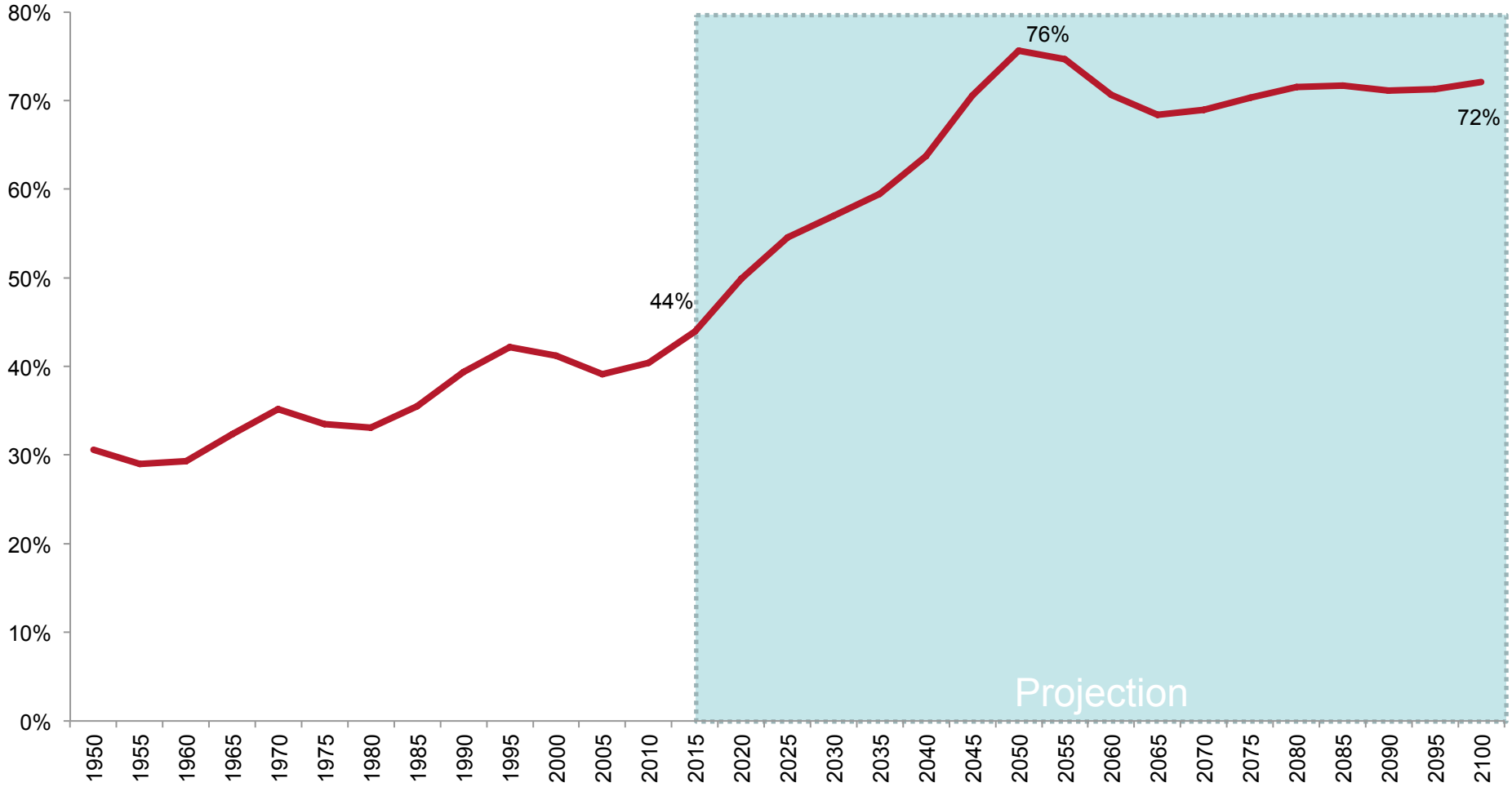


Pension age

	Statutory retirement age (Current Law)*
Armenia	63
Azerbaijan	58/63
Belarus	55/60
Bulgaria	60/63
Croatia	60/65
Czech Republic	55-61/62.5
Estonia	60.5/63
Georgia	60/65
Hungary	62
Kazakhstan	58/63
Kyrgyz Republic	58/63
Latvia	62
Lithuania	60/62.5
Moldova	57/62
Poland	60/65
Romania	59/64
Russian Federation	55/60
Serbia	60/65
Slovak Republic	59.5/62
Slovenia	56.3/63
Turkmenistan	57/62
Ukraine	55/60
Uzbekistan	55/60

	Statutory retirement age (Current Law)*
Australia	67
Austria	65
Belgium	65
Canada	65
Denmark	67
Finland	65
France	65
Germany	67
Greece	65
Iceland	67
Ireland	65/66
Israel	67
Italy	60/65
Japan	65
Luxembourg	65
Netherlands	65
New Zealand	65
Norway	67
Portugal	65
Spain	65
Sweden	65
Switzerland	64/65
United Kingdom	68
United States	67

Old age dependency ratio*



* Population aged 65+ divided by population aged 20-64

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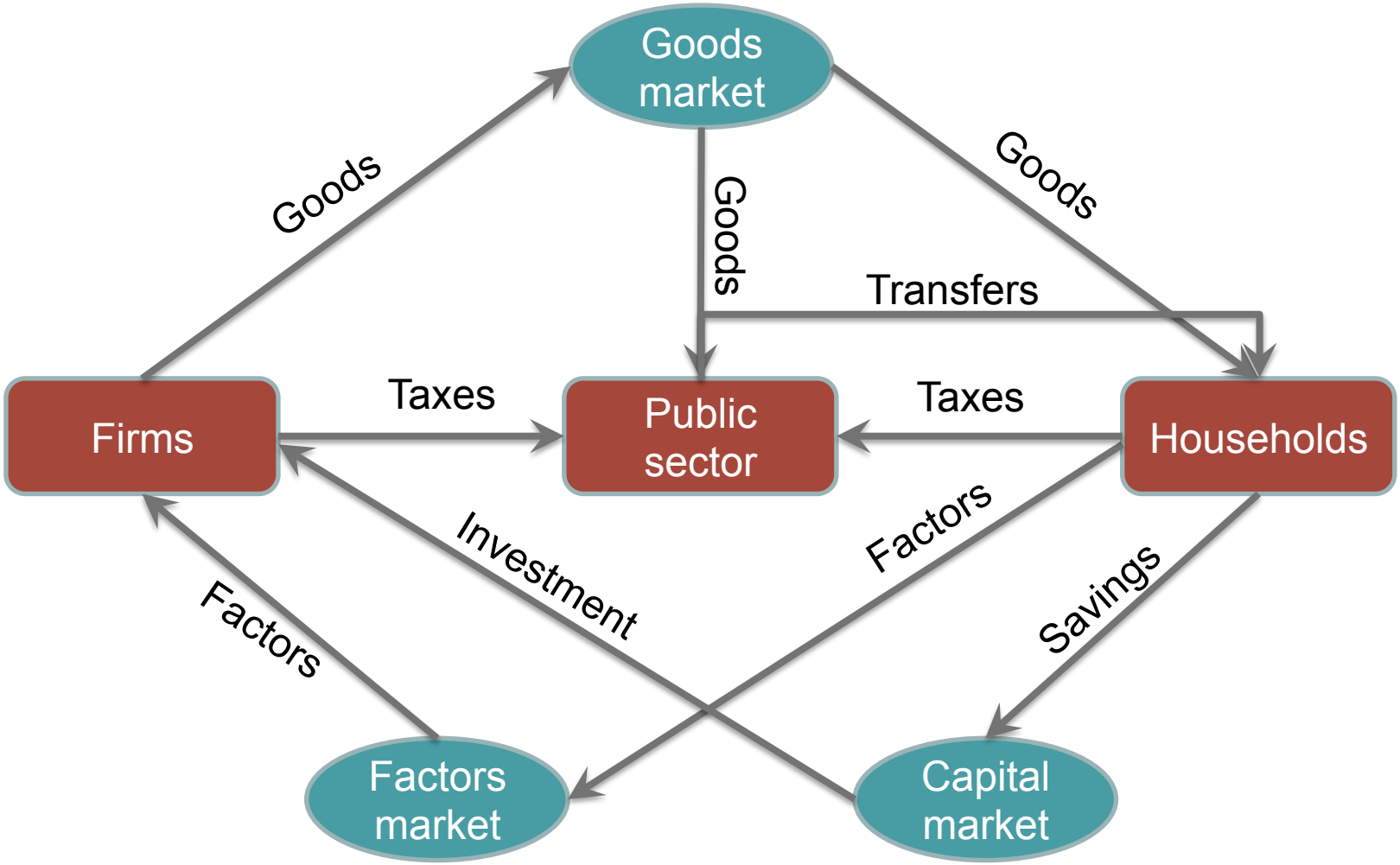
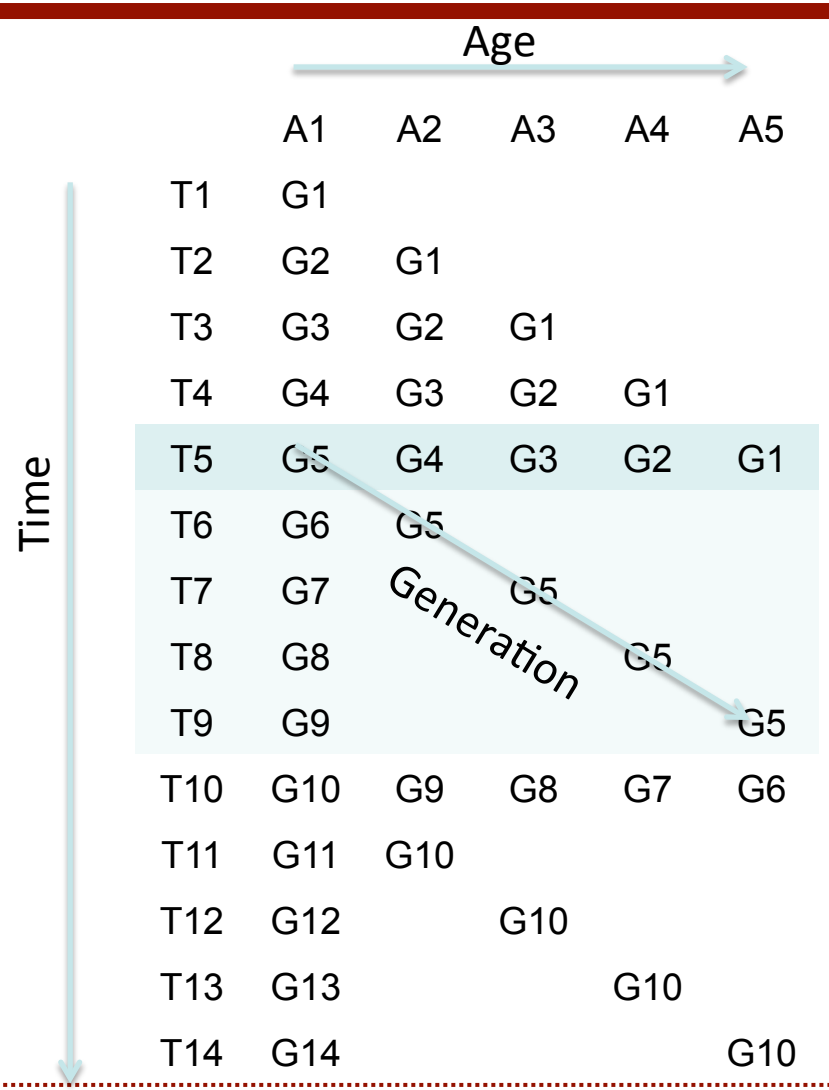
Structure of a CGE model

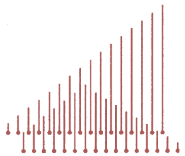


Overlapping generations structure



Main features of the model

- Closed economy
  - Interest rate reacts to population ageing
- One final good
  - Cobb-Douglas production function
- Demography:
  - 21 generations (0-4, … 100+)
  - time-variable **fertility** rate
  - time/age-variable **mortality** rates
- Unintentional bequests
  - distributed via a perfect annuity market
- Age-specific private consumption
  - Hump-shaped
- Age-specific public consumption
  - Health and education



Household problem. Forward-looking

- Household Utility Function

$$U = \frac{1}{1-\theta}\sum_{k=4}^{20}\left\{\left[\frac{1}{1+\rho}\right]^{k}\Pi_{m=0}^{k} sr_{t+m,g+m}\left((C_{t+k,g+k})^{1-\theta}\right)\right\} \qquad 0< \theta < 1$$

- Household Budget Constraint

$$HA_{t+1,g+1} = \frac{1}{sr_{t.g}}\left[Y_{t,g} + (1+Ri_t)HA_{t,g} - C_{t,g}\right]$$

$sr_{a,t}$ -- conditional probability of survival from age *a* to age *a+1*

- Euler Equation

$$\frac{C_{t+1,g+1}}{C_{t,g}} = \left(\frac{1+r_{t+1}}{1+\rho}\right)^{1/\theta}$$

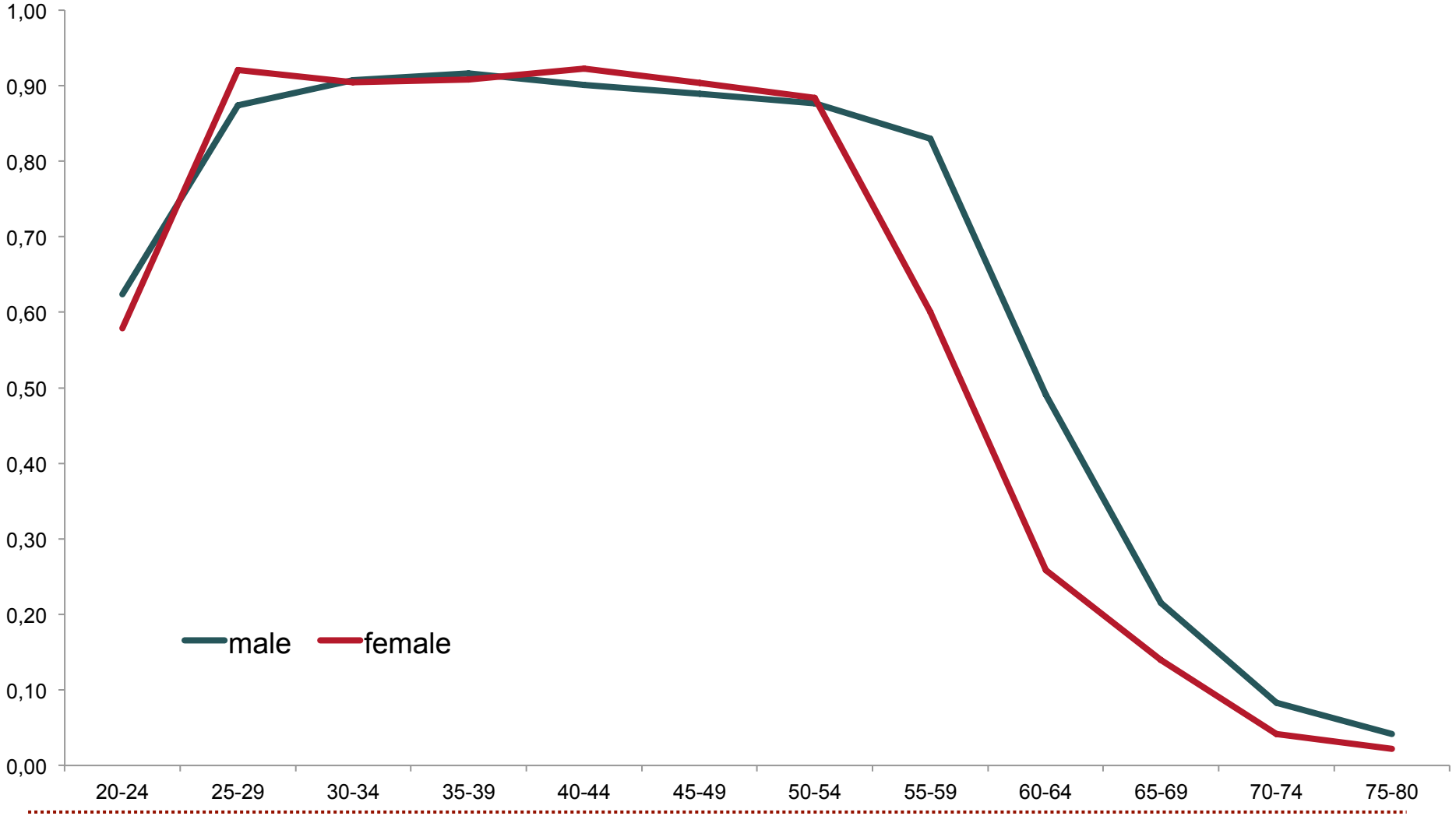
- Household problem is qualification- and origin-specific

Government

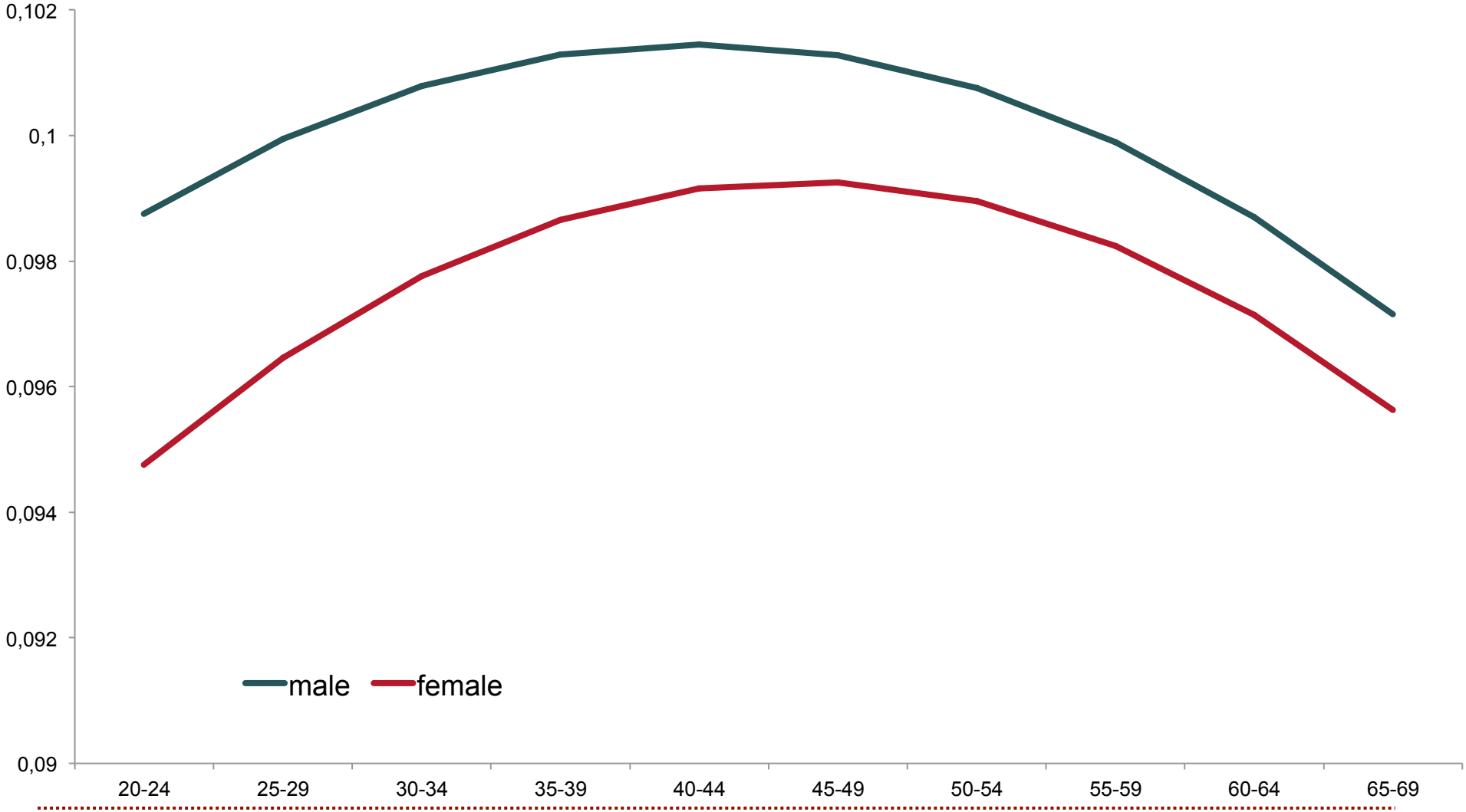
- Revenues
  - Income tax
  - Consumption tax
  - Capital tax
  - Pension contributions
- Expenditures
  - Government spending
    - Fixed share of GDP
  - Pensions
    - Various scenarios

- The model is calibrated on 2013 SAM constructed from
  - National accounts
  - Government budget
  - Pension Fund balance
- Labour market characteristics from the LFS
  - Employment rates
  - Earnings profiles

Employment rates



Earnings profiles



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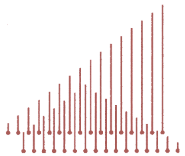
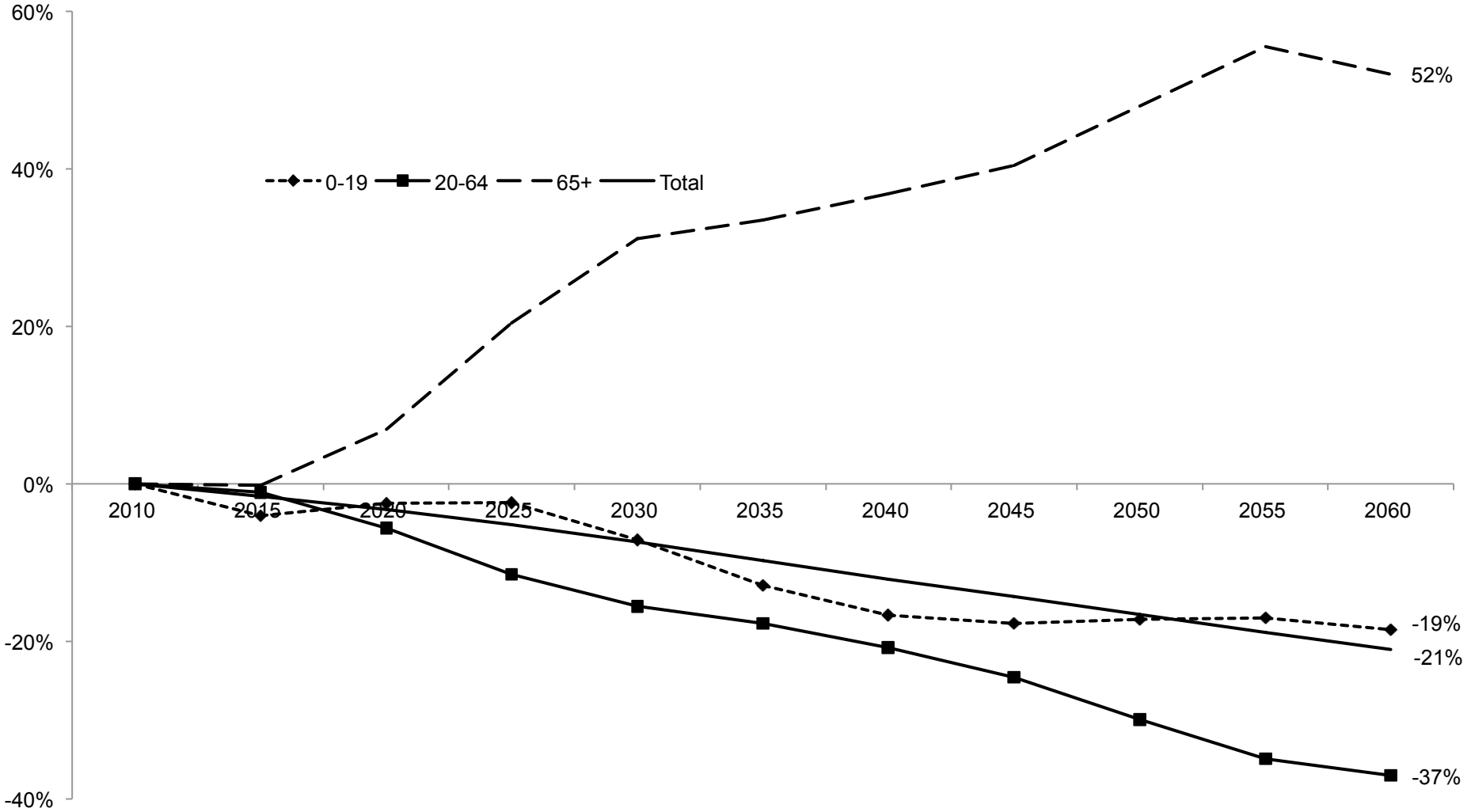


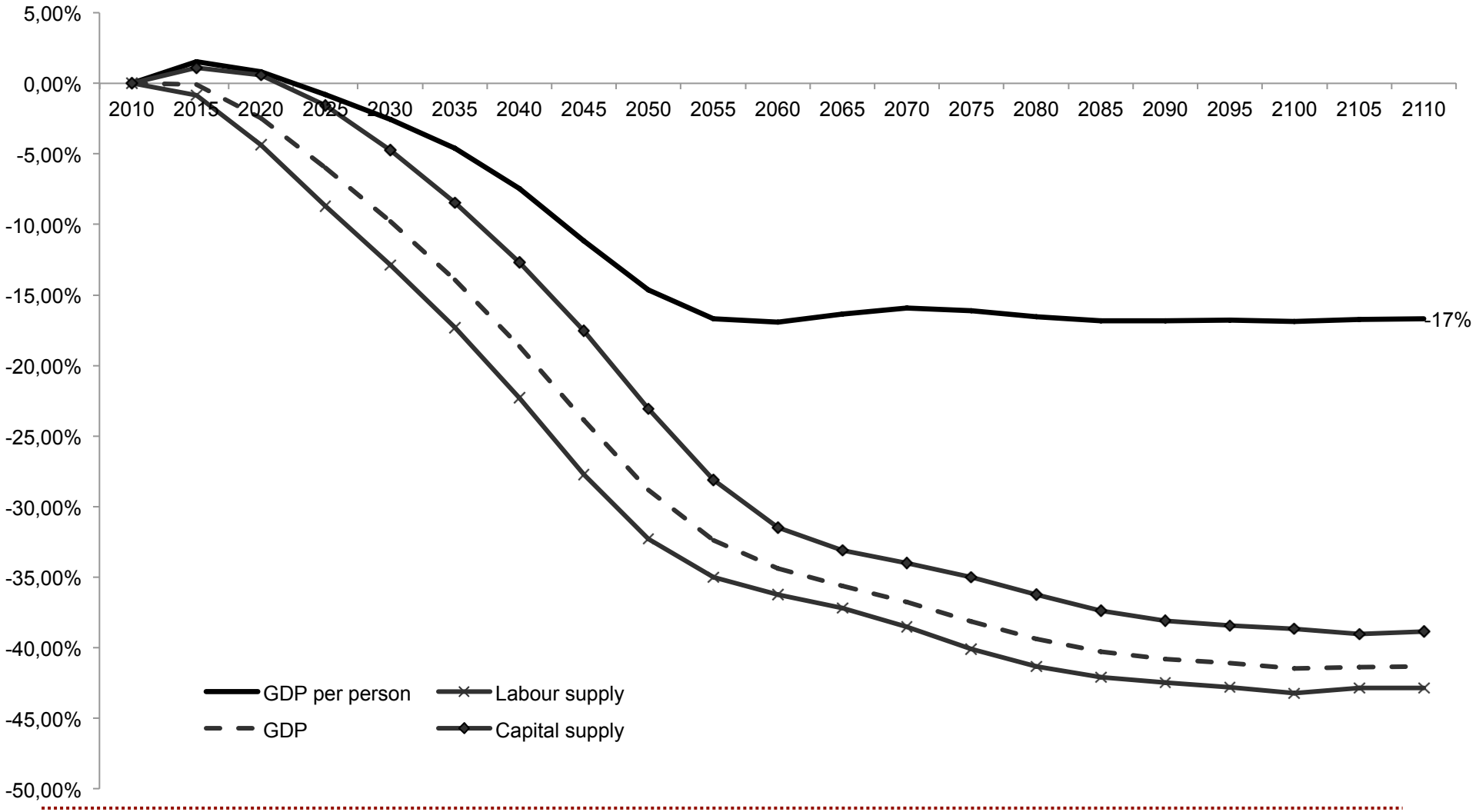
UN population projections – medium scenario



Baseline scenario

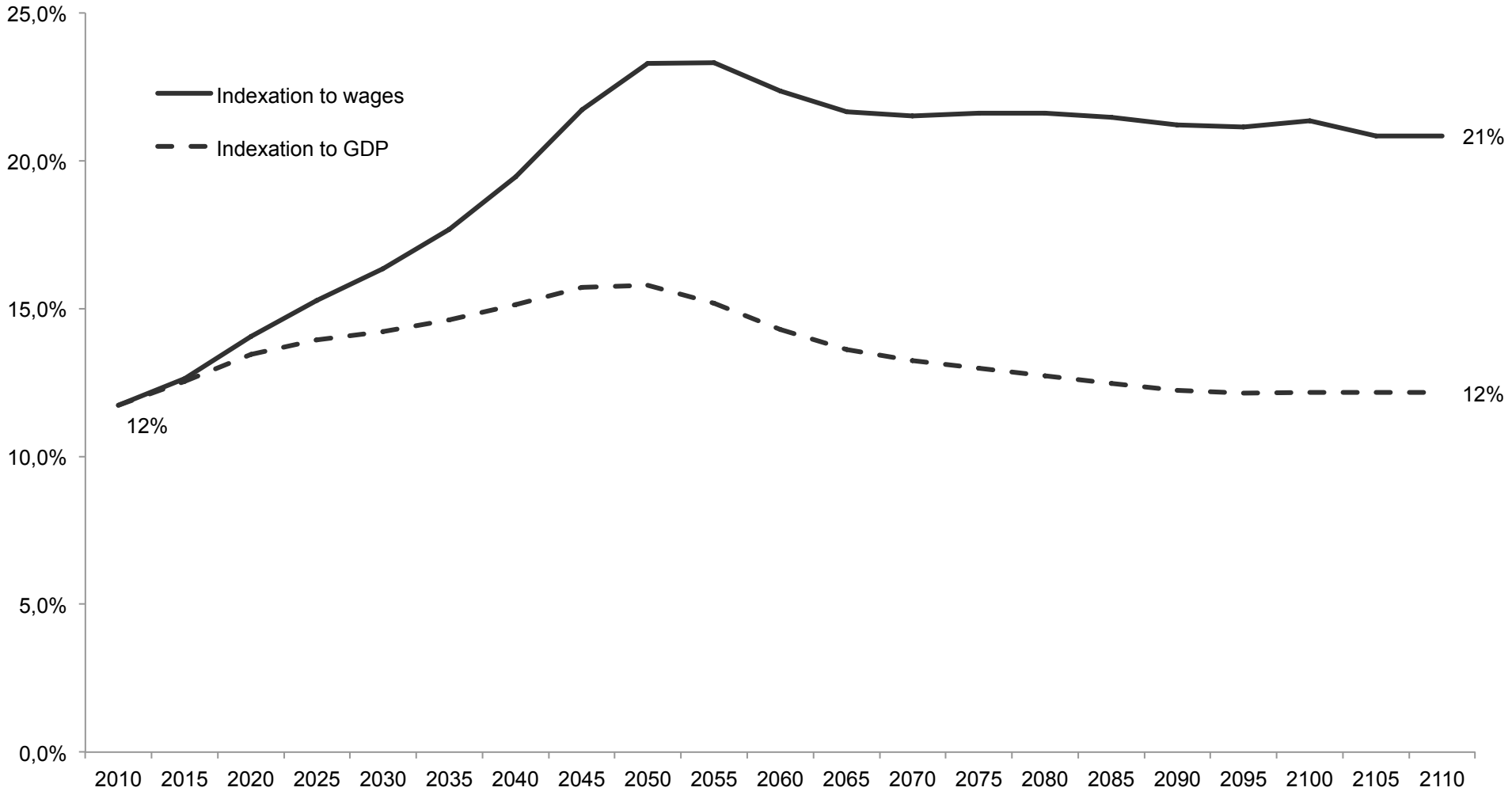
- UN medium population projection
- TFP growth 2% per year
- Pensions indexed
  - to wages
  - to GDP
- Taxation increases to close government budget constraint

Output and factors of production

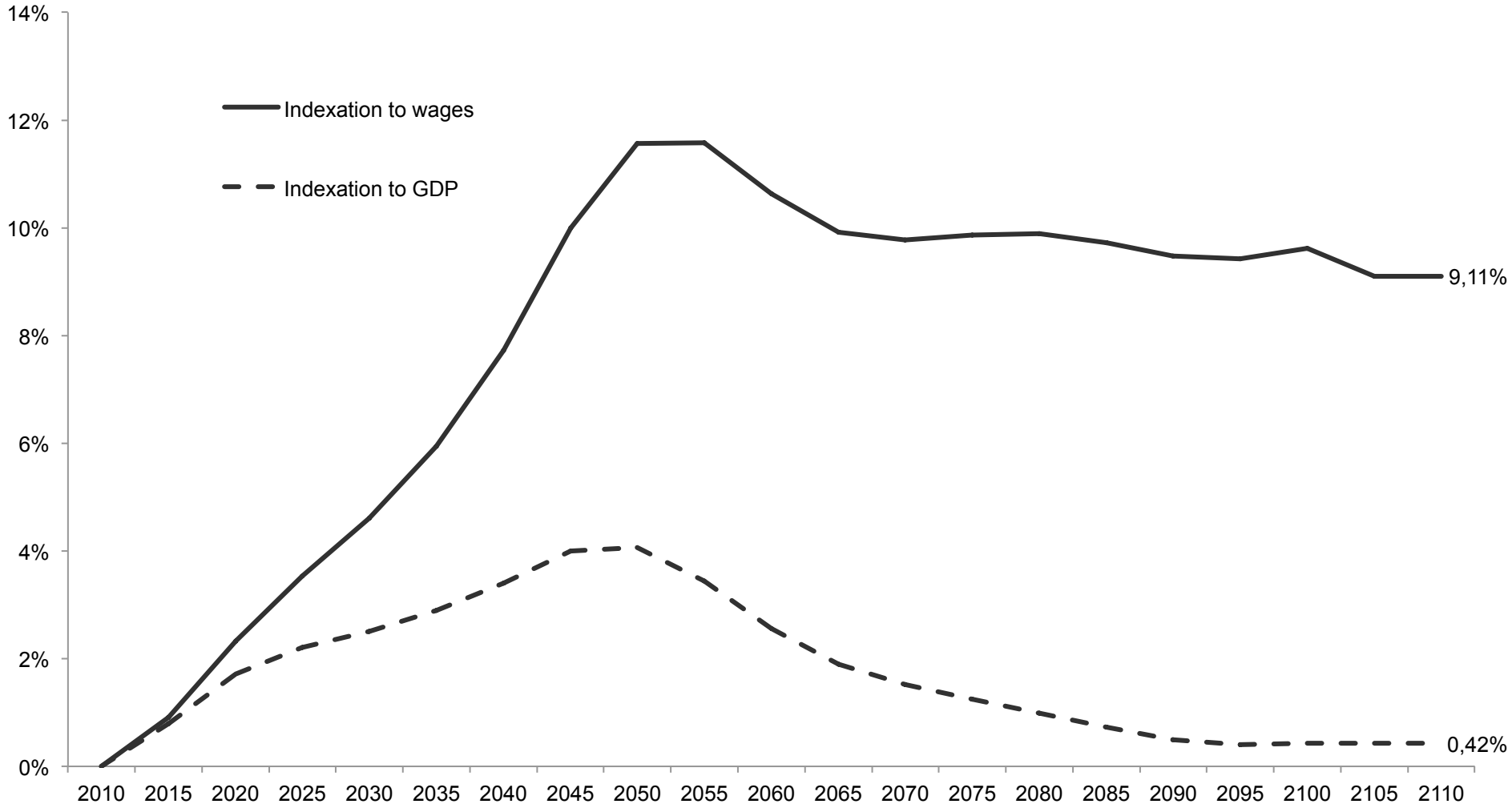


- Change funding (contribution rate)
- Change spending (replacement rate)
- Change pension age
  - Increase state pension age for women to 60 by 2025
  - Increase state pension age for both sexes to 65 by 2035

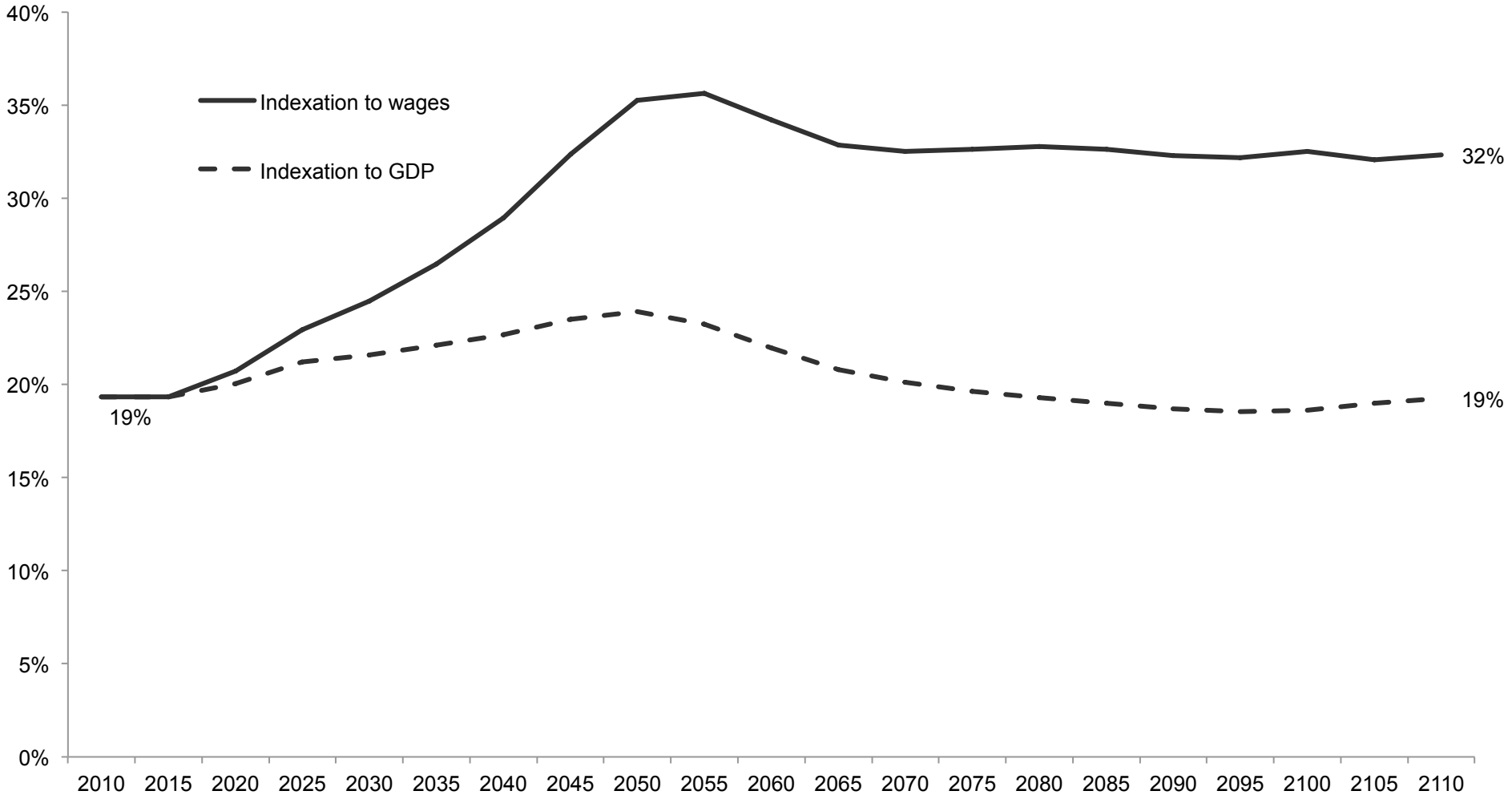
Pension payments as a % of GDP



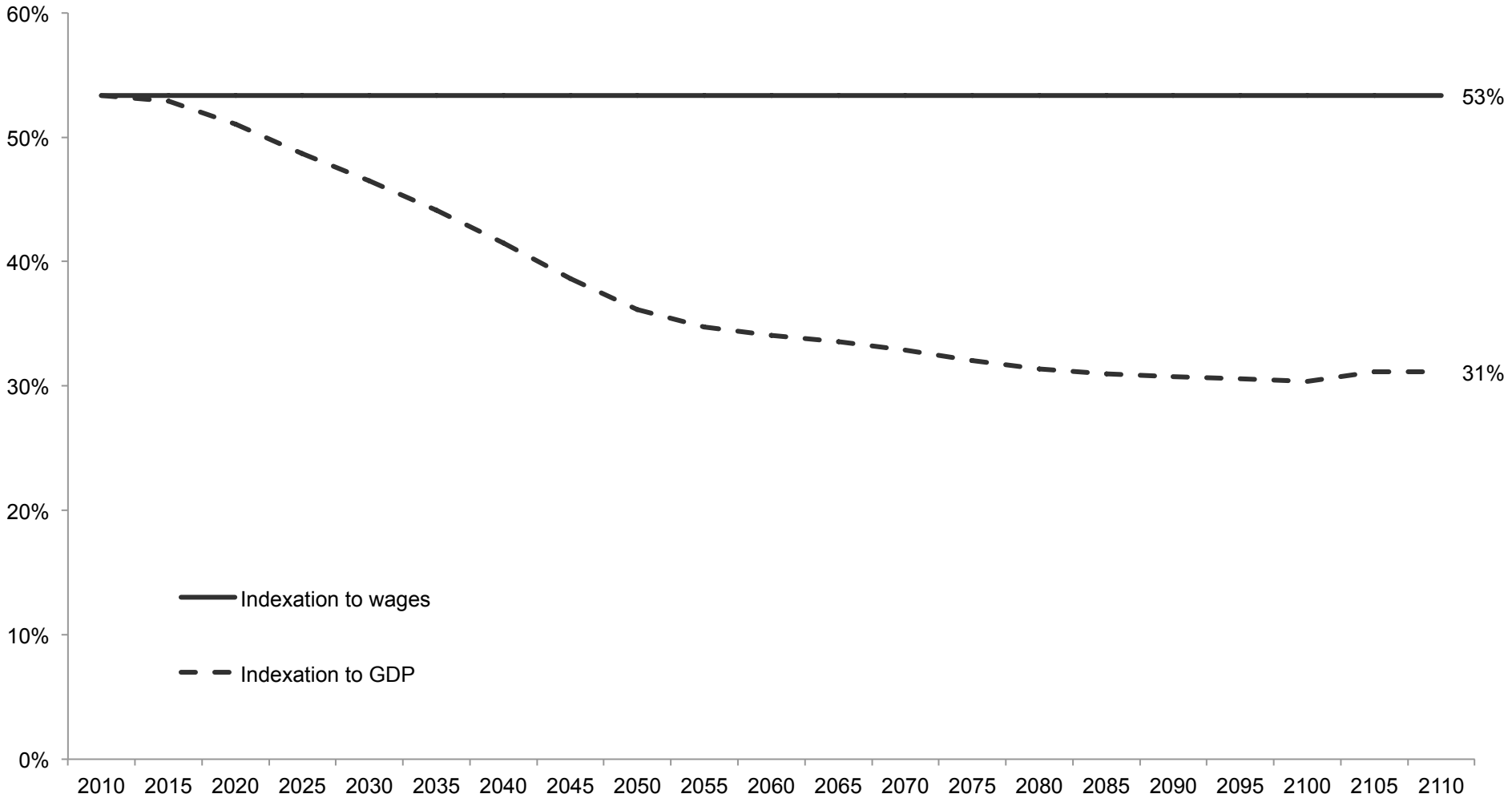
Taxation level % of GDP, pp difference



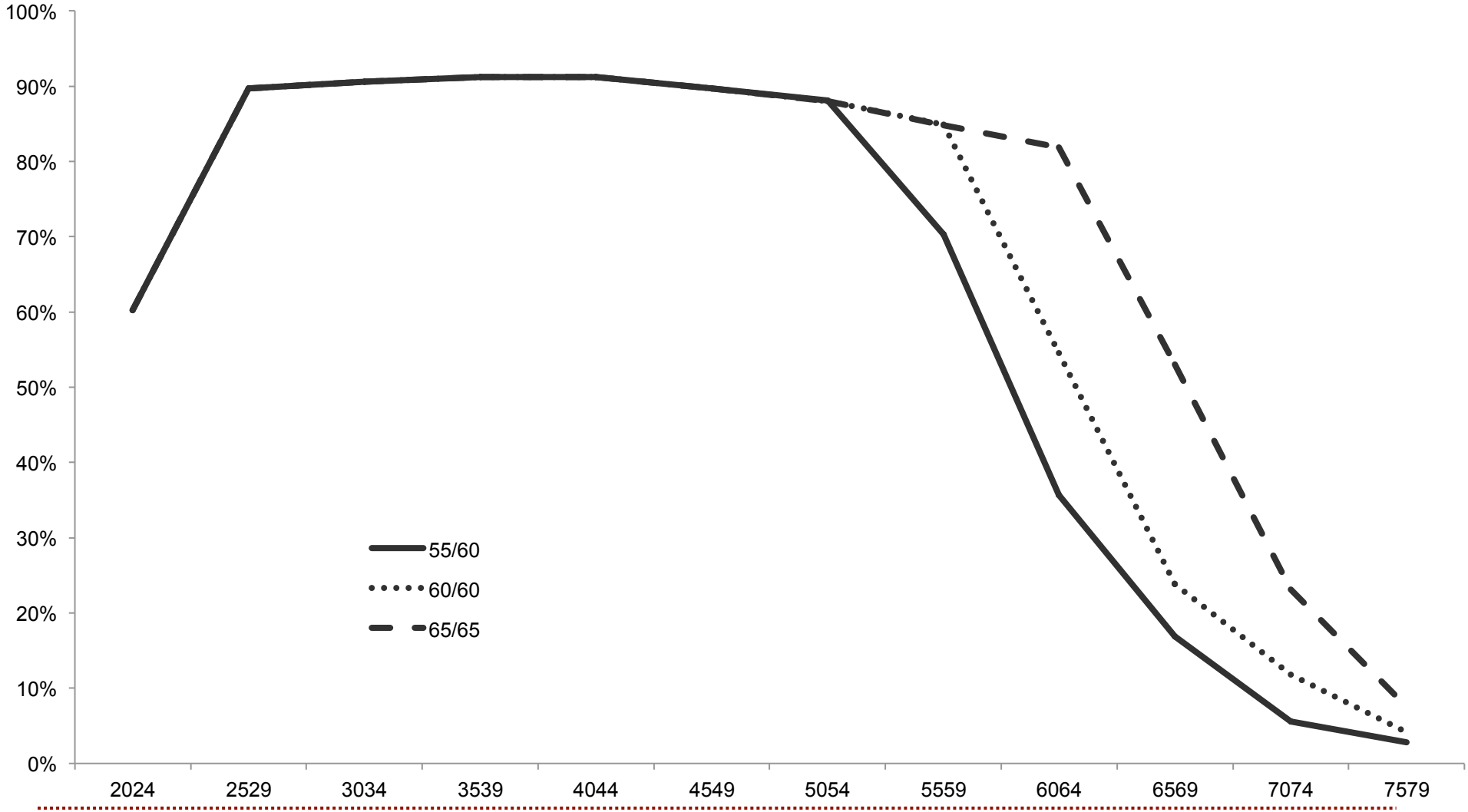
Contribution rate



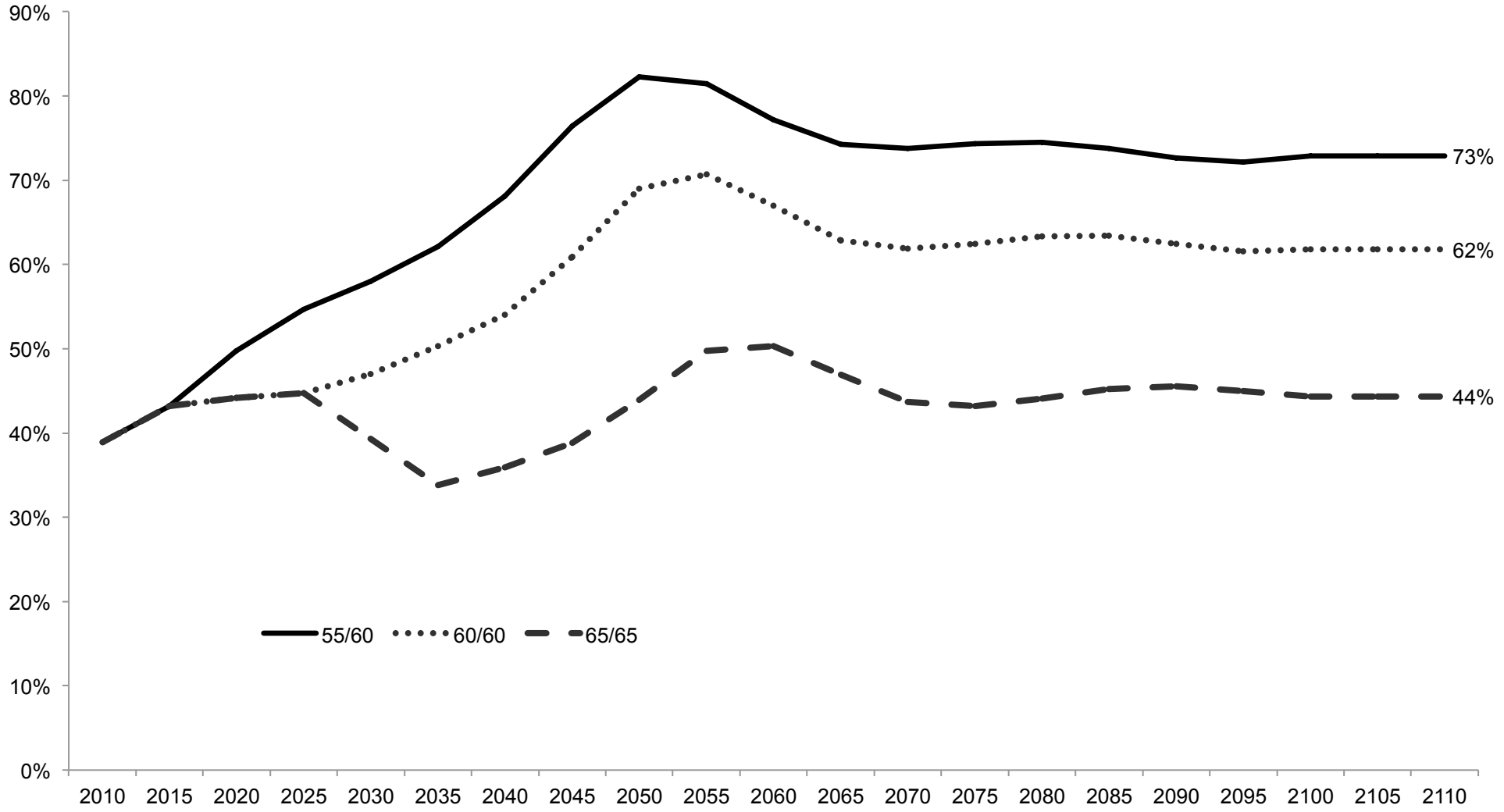
Replacement rate



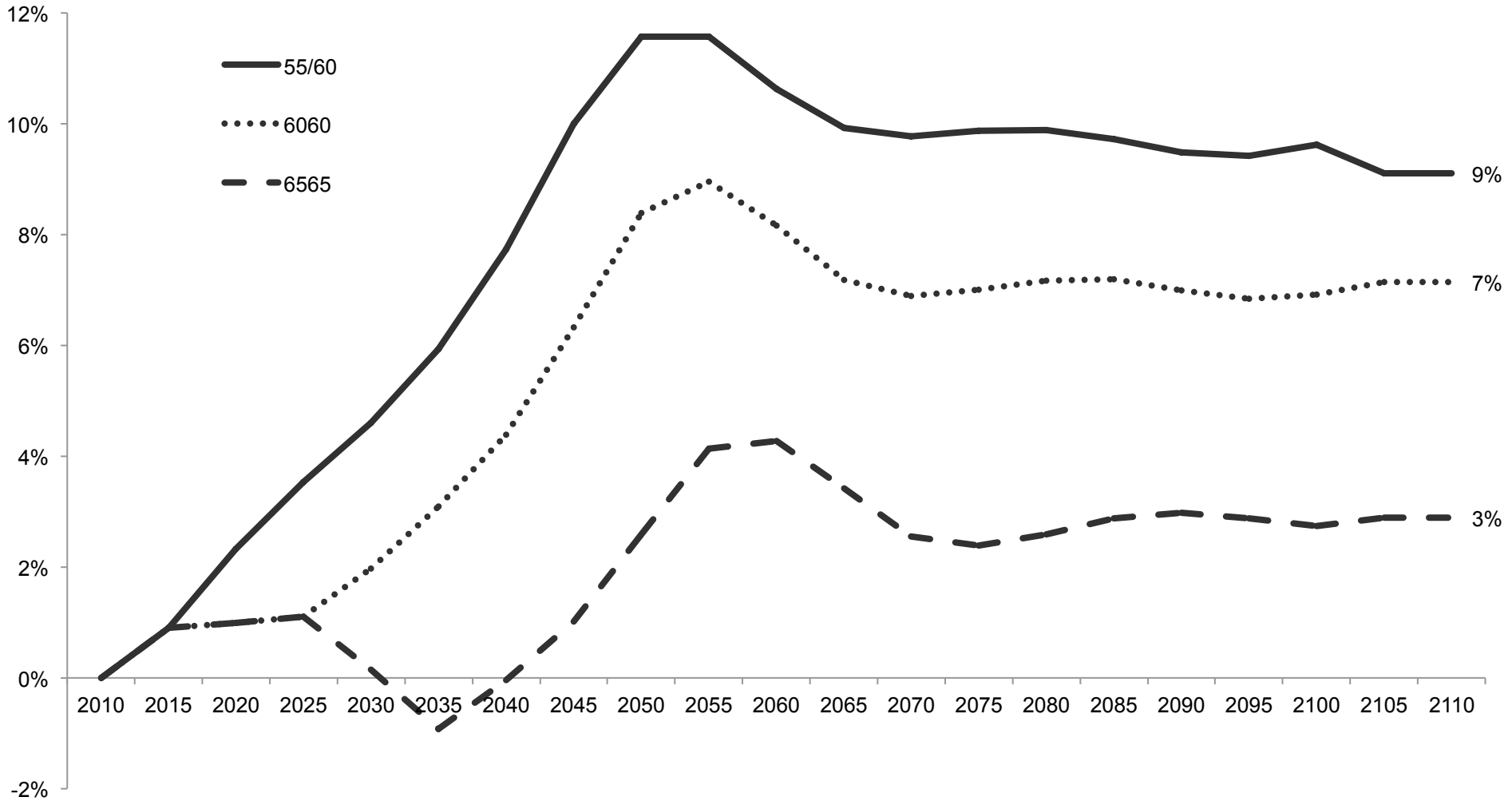
Employment rates in different pension age scenarios



Old age dependency ratios in different pension age scenarios



Taxation level as a % of GDP, pp difference



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