

Actuarial analysis of pension schemes

- For a pension scheme, the periodical actuarial review is like a personal health check-up
- The actuarial analysis of pension schemes requires to deal with complex demographic, economic, financial, institutional and legal aspects that all interact with each other
- Only with the help of sound financial analysis can decision-makers decide how to enhance and modernize their pension schemes



What is the logic behind PROST?

PROST = « **Pension Reform Options Simulation Tool** »

Designed and built to answer the following questions and related ones:

- How much will the pension system cost?
- What are the future benefits?
- What is the implicit debt?
- What are the financial outcomes of the different reform scenarios?
- Is the system going to be able to keep its promises?



Assumptions

- **Demographic assumptions**
 - fertility
 - mortality
 - migration
- **Economic assumptions**
 - wage growth
 - inflation
 - discount rate
- **Behavioral assumptions**
 - decisions to contribute
 - retirement patterns



Steps for projections:

- Population of the country by age/sex
- Identify how many people are members, and how many are receiving pensions
- Calculate revenue figures: number of contributors by age/sex, average salary age/sex, contribution rate, and other revenue sources
- Calculate the expenditure figures: benefits to new pensioners, indexation of benefits to stock of retirees, benefits to widows and orphans and other expenditures
- Calculate the current balance: revenue minus expenditures with potential fund accumulation



Simulations of ‘parametric’ reforms:

- Change contribution rates
- Change eligibility conditions
 - Retirement age
 - Years of service required
- Change benefits provided
 - Replacement rates
 - Wage base on which pensions are calculated
 - Indexation of benefits



Simulations of ‘structural’ reforms:

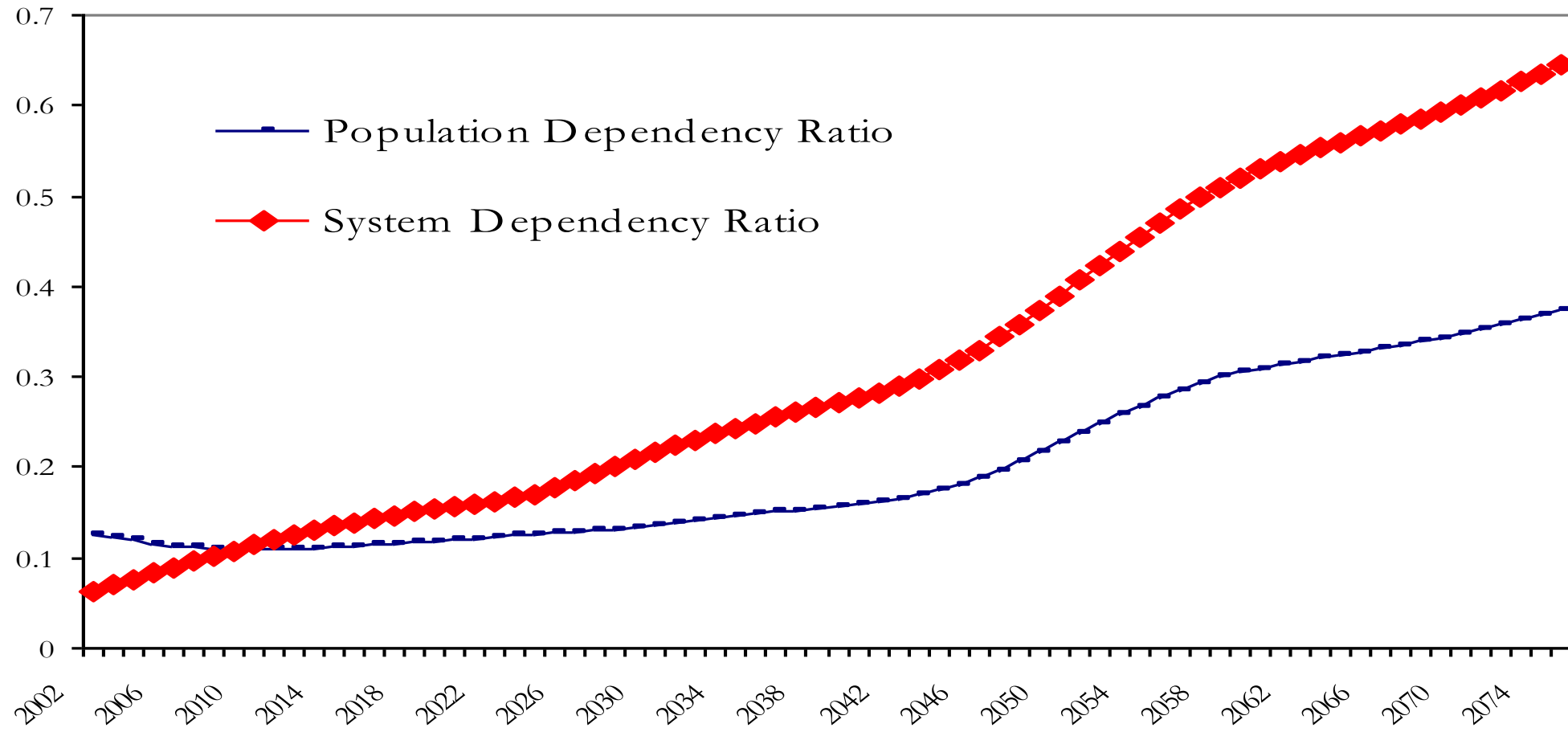
- Any combination of:
 - Conventional PAYG (reformed or not)
 - Notional Accounts
 - Funded pillar of individual accounts

- Who are the switchers ? Who are the members that stay in the old system?

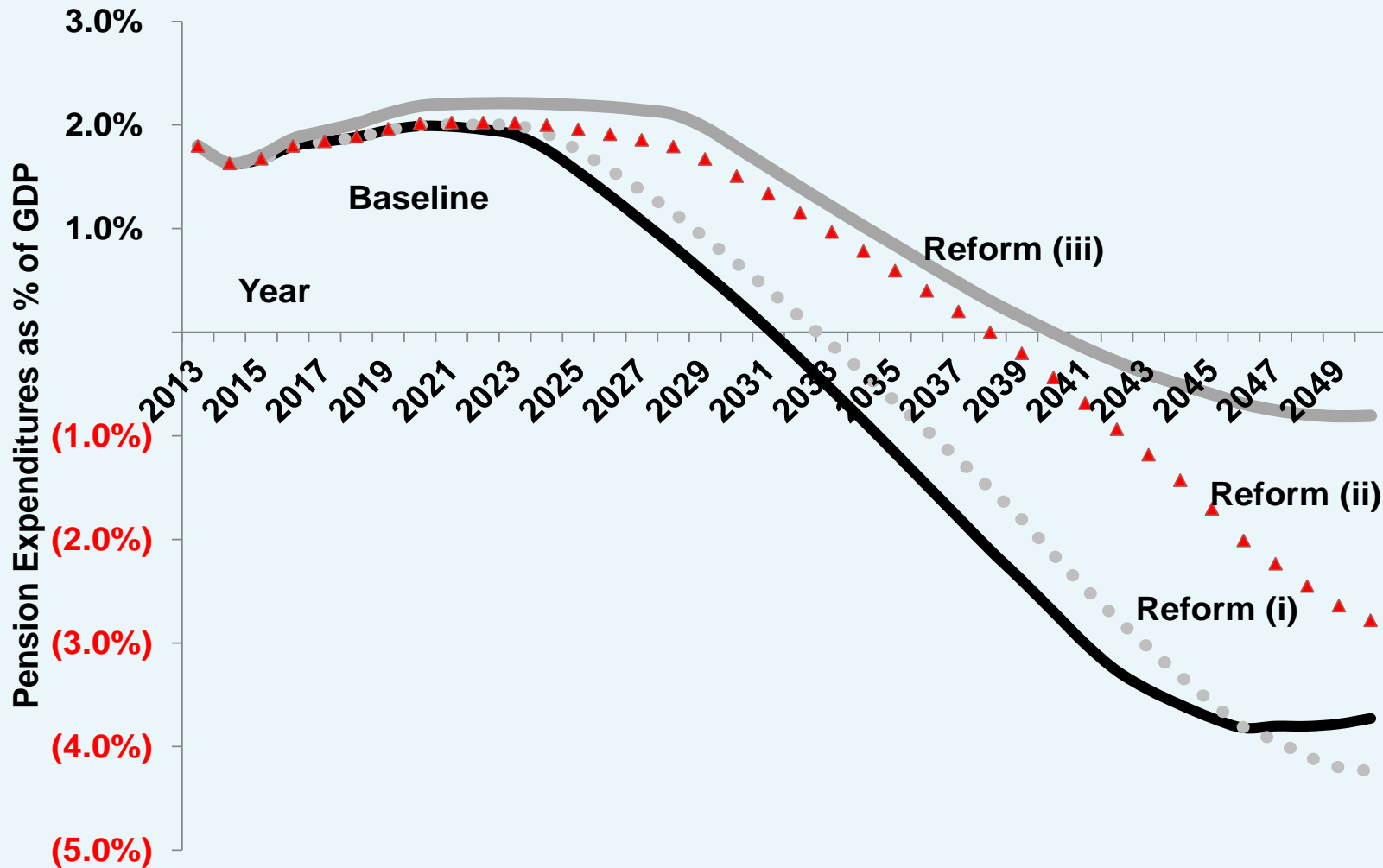
- How would the accrued rights be recognized?
 - Proportional pensions
 - Recognition Bonds



Demographic pressures and system maturation



Current balance under several reform options



Individual impact

□ Analysis on how individuals (with different years of service, income levels or from different generations) fare under different arrangements?

- Under statutory contribution/benefit rates
- If contribution rates changed to maintain PAYG balance
- If replacement rates changed to maintain PAYG balance
- Under pure funded defined contribution system
- Under multi-pillar