

Designing pension systems

DEFINING RETIREMENT-INCOME ADEQUACY

BALANCE: ADEQUACY | INCOME-REPLACEMENT SCHEMES



WORLD BANK
PENSIONS CORE COURSE
WASHINGTON DC
OCTOBER 2019

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Goal of retirement-income provision

- Primary objective
 - ensuring older people have a decent standard of living in retirement
- Two interpretations
 - **'Core' adequacy**: ensuring older people meet a basic standard of living
 - **'Broad' adequacy** or 'income-replacement': ensuring a reasonable standard of living in retirement relative to position before retirement

Measuring core and broad adequacy

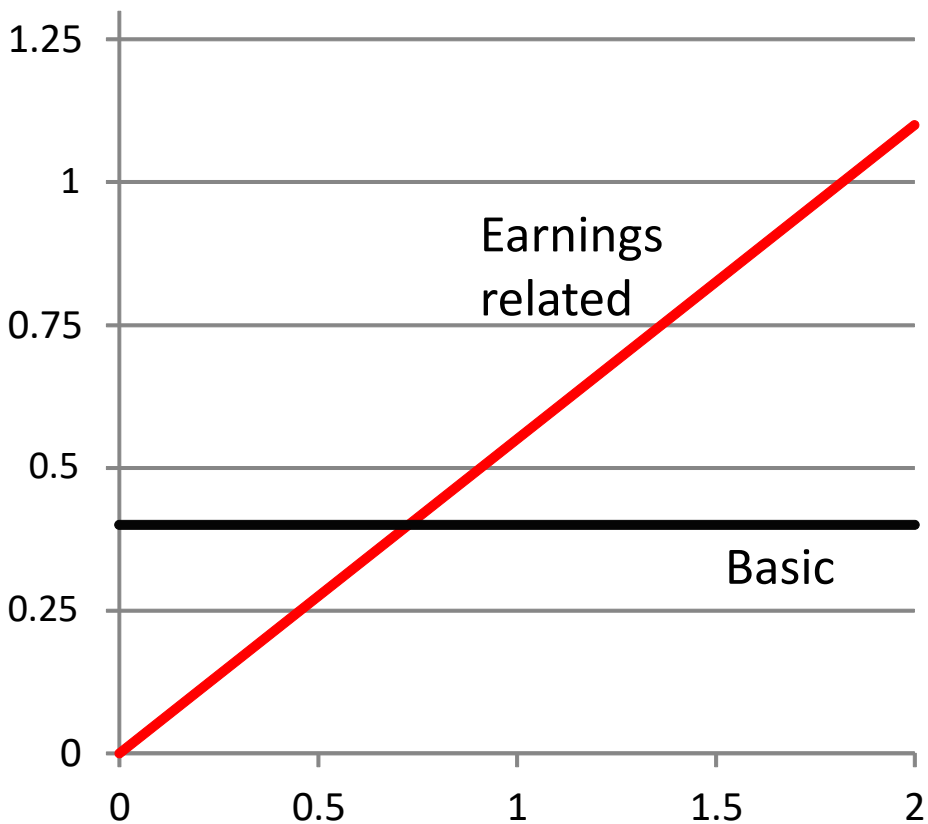
- Core adequacy: an **absolute** measure of living standards
 - individual pension entitlement as a proportion of economy-wide average earnings
 - **relative pension level**
- Income-replacement: a **relative** measure of living standards
 - individual pension entitlement relative to individual earnings when working
 - **replacement rate**

International experiences

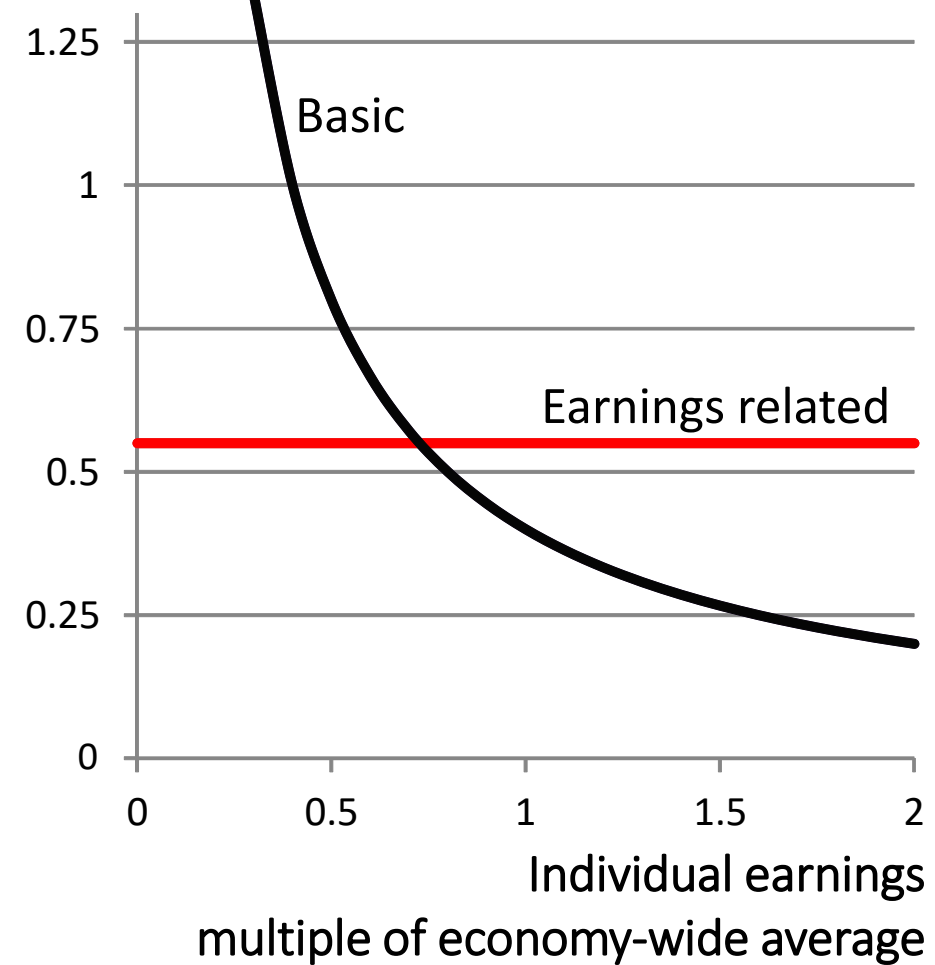
- Different degrees of emphasis on the alternative approaches: **core-adequacy** and **income-replacement**
- Analysis of **mandatory** retirement-income provision
 - using Apex models for OECD countries
- Highly redistributive systems versus strong link between pension entitlements and individual earnings
 - (and intermediate cases)
- Two benchmarks:
 - universal, flat rate benefit
 - constant replacement rate

Benchmarks

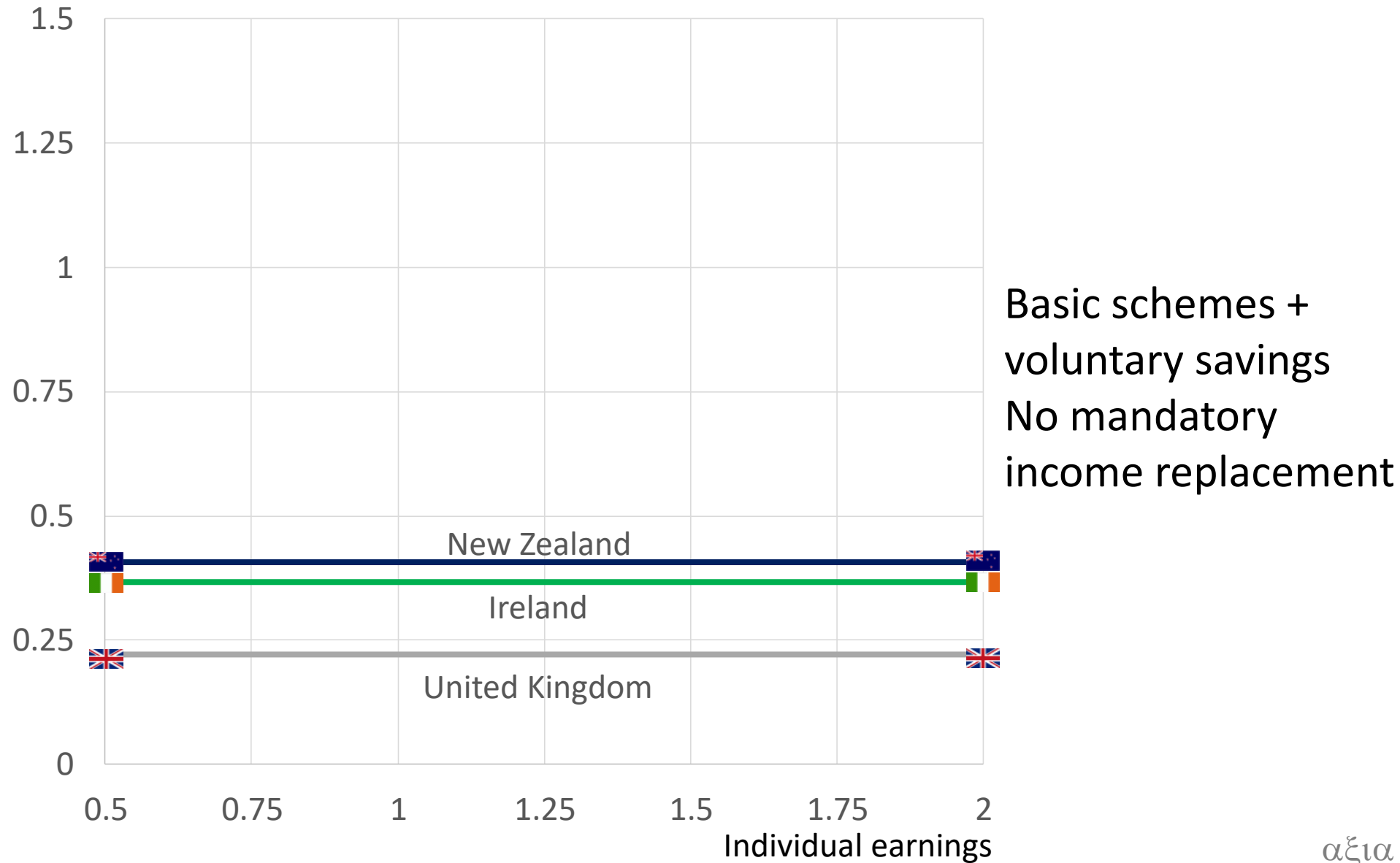
Relative pension level



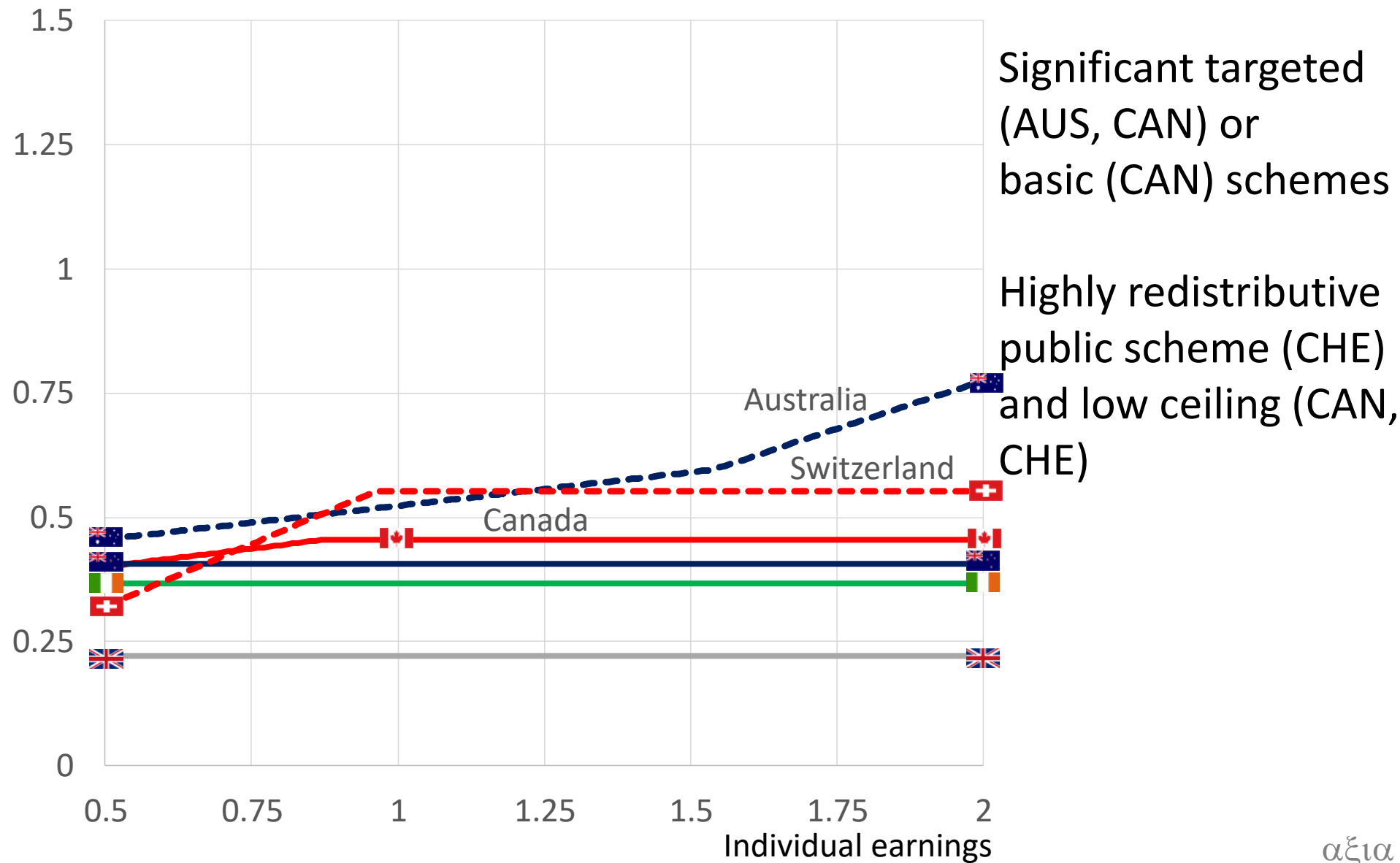
Replacement rate



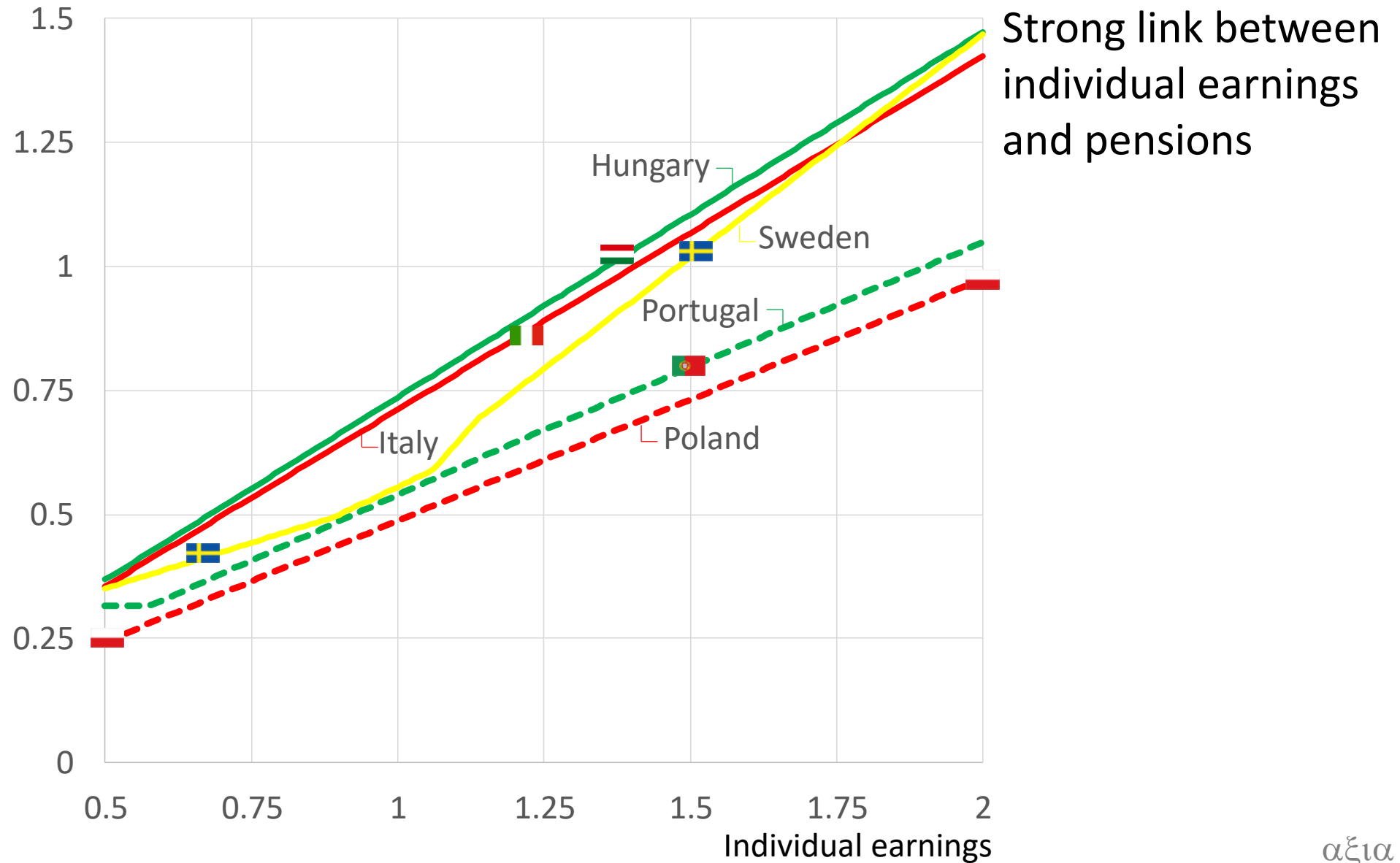
Relative pension level



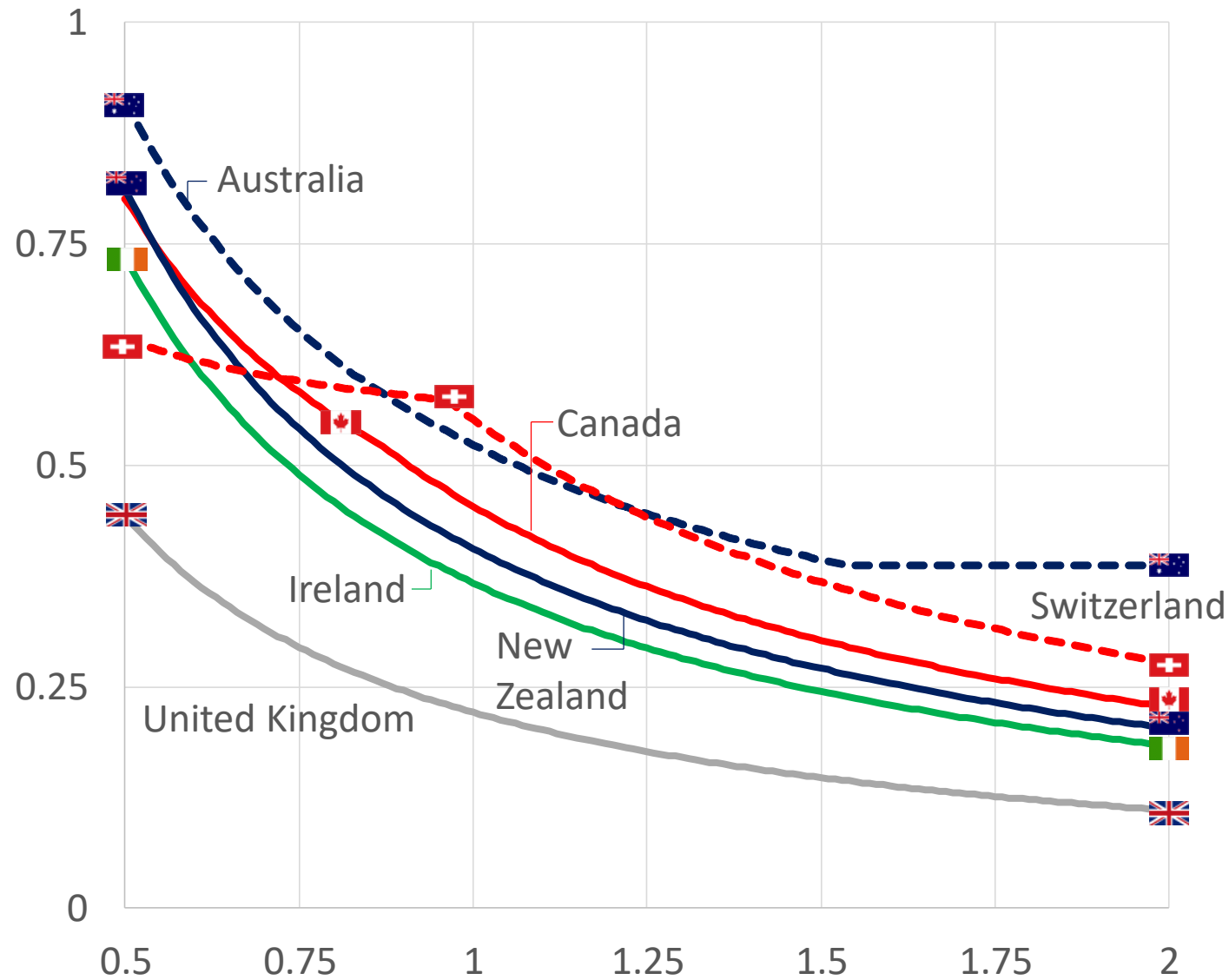
Relative pension level



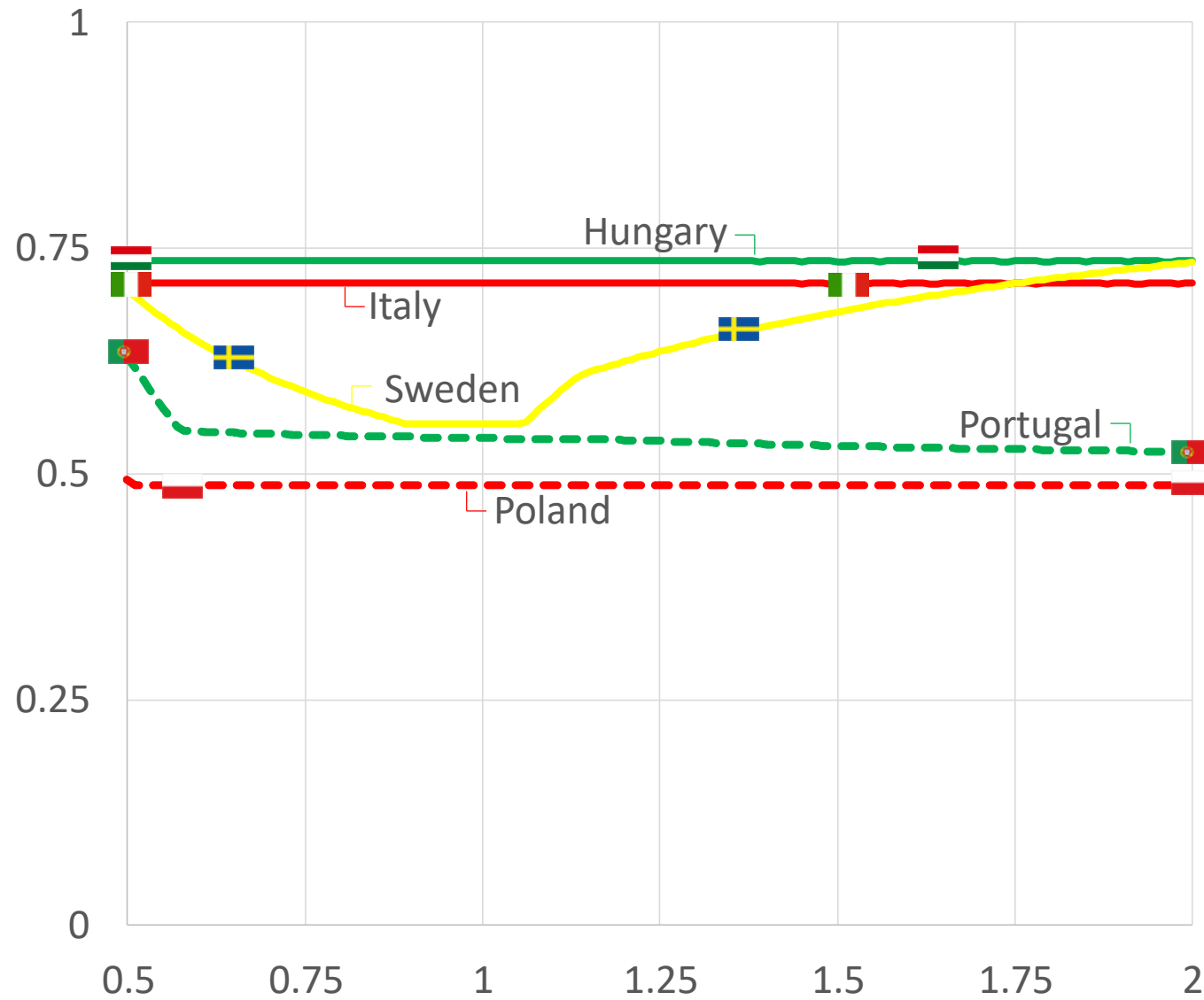
Relative pension level



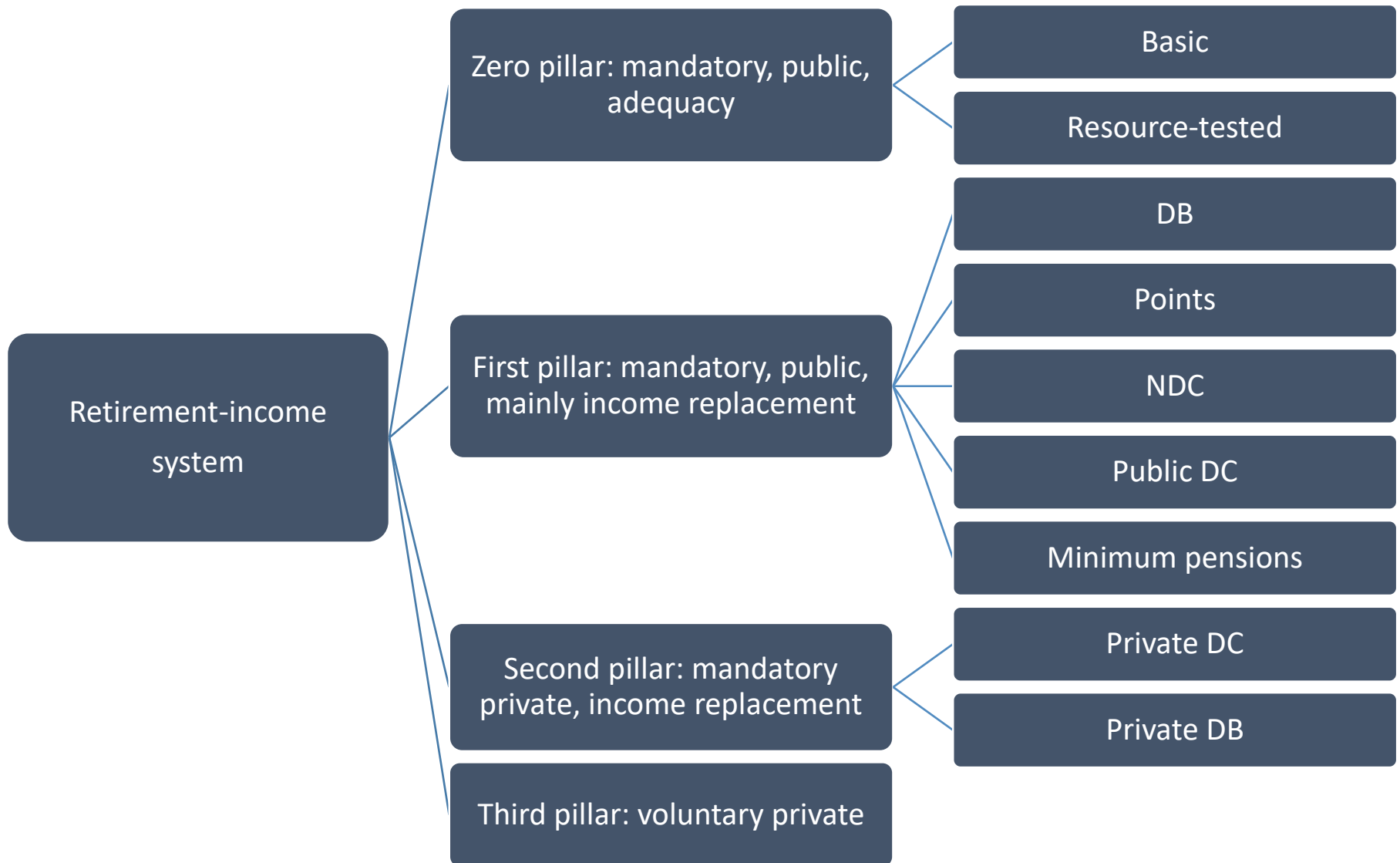
Replacement rate



Replacement rate



World Bank's multi-pillar framework



Design of income replacement pensions

EARNINGS-RELATED SCHEMES

DEFINED-BENEFIT | POINTS | NOTIONAL-ACCOUNTS



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Single, over-arching principle

- **Each dollar, euro *etc.* of contributions should produce the same amount of benefits to all individuals**
- It does **not** say that each contribution should deliver benefits equal to the amount contributed

Fairness

- Pension systems based on this principle are **fair**:
 - between people at different stages of their careers
 - between low and high earners
 - between early, normal and late retirees
- Many pension systems are **unfair**:
 - it favours short contribution histories over longer
 - low earners get relatively more than higher earners
 - early retirees receive benefits for longer, which is not adequately taken into account

Incentives

- Pension systems based on the core principle – of equal contributions for equal benefits – **minimize distortions to individuals' economic behaviour**
 - saving, labour-supply, retirement and contribution decisions
- Gains from well-meaning policies addressing important challenges can be outweighed by their negative side-effects

Unintended consequences

- Powerful incentives to contribute for short periods and move into the informal sector
- Encourage under-declaration of earnings towards or down to the minimum wage
- Induce people to retire earlier than under a neutral pension system
- **Fairness and incentives go hand-in-hand**

Violating the fundamental principle

- Might be justified
- But the onus of proof must be on the violator
 - Men *versus* women
 - Clash between objective of retirement-income adequacy and strict fairness/incentives
- But many ways to ensure adequacy with different effects on fairness and incentives

Three kinds of earnings-related plan

- **Defined benefit**

AUT, BEL, CAN, CZE, FIN, FRA, GRC, HUN, ISL,
JPN, KOR, LUX, NLD, PRT, SVN, ESP, GBR, USA

$$DB = \sum_{i=0}^R w_i (1+u)^{R-i} a$$

- **Points**

EST, FRA, DEU, SVK

$$PP = \sum_{i=0}^R \frac{w_i v_R}{k_i} = \sum_{i=0}^R \frac{w_i v_i}{k_i} (1+x)^{R-i}$$

- **Notional accounts**

ITA, NOR, POL, SWE

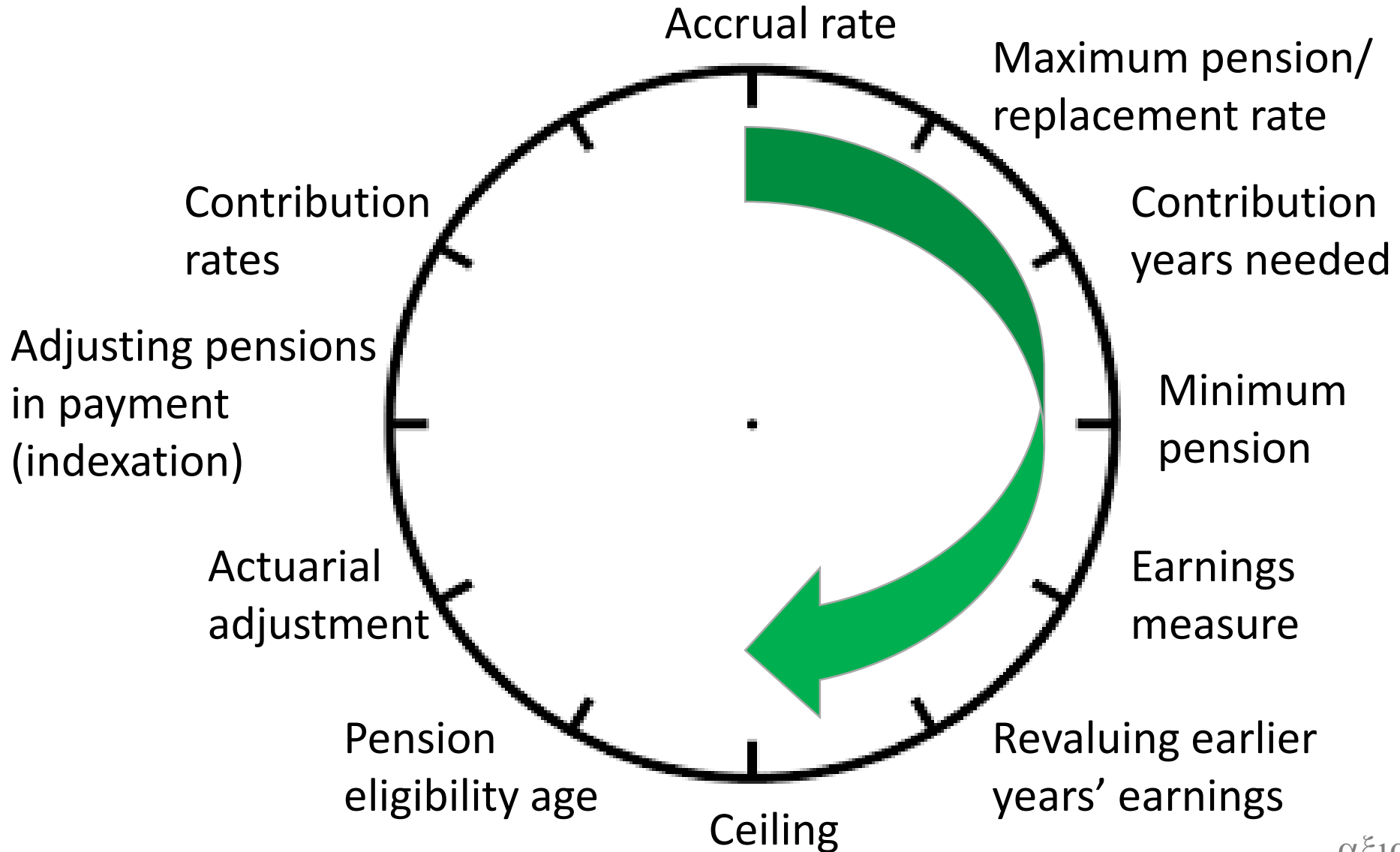
$$NA = \sum_{i=0}^R \frac{w_i c}{A} (1+n)^{R-i}$$

- **Two identities**

if $u = x = n$

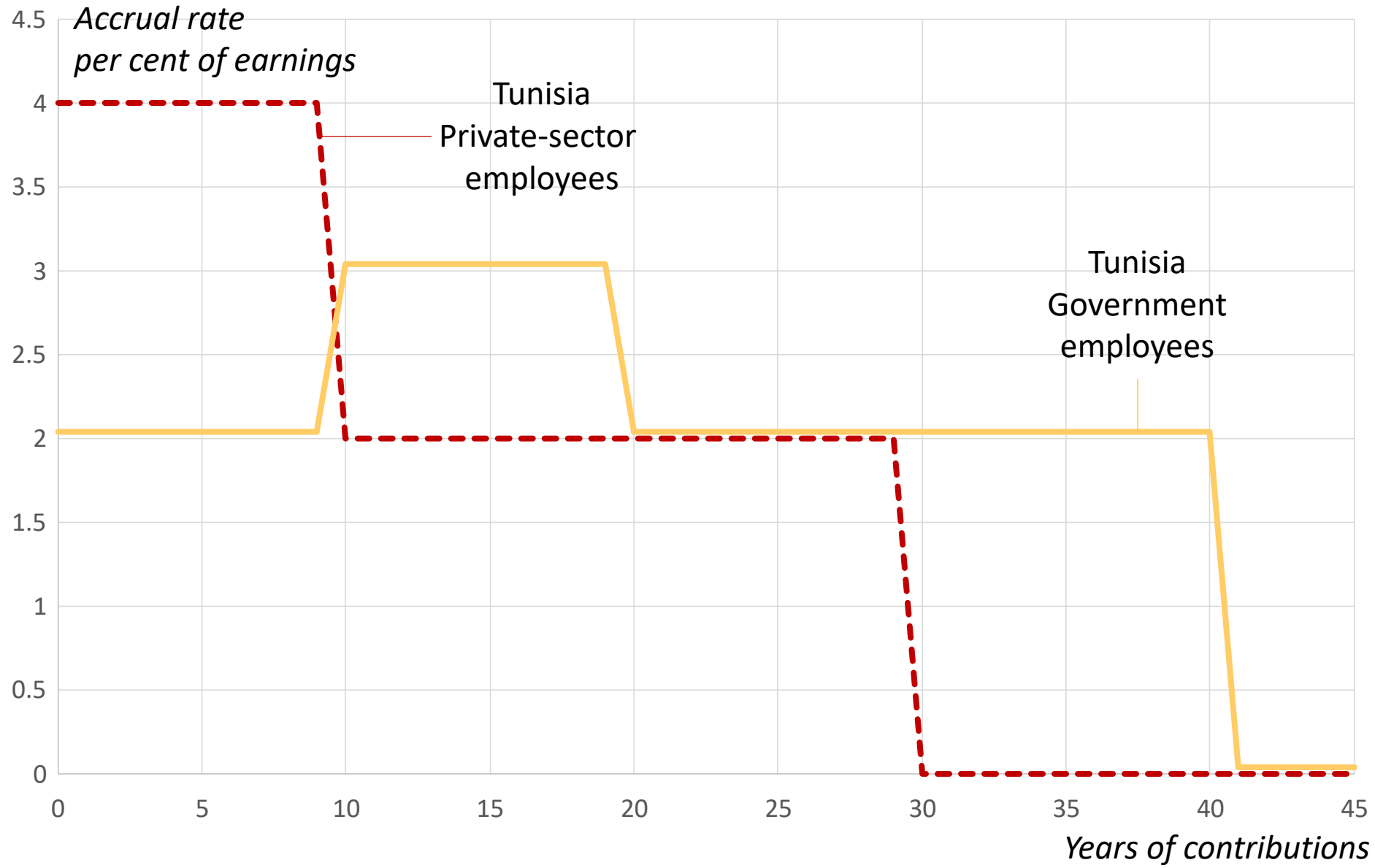
then $a = v / k = c / A$

Eleven parameter and rules

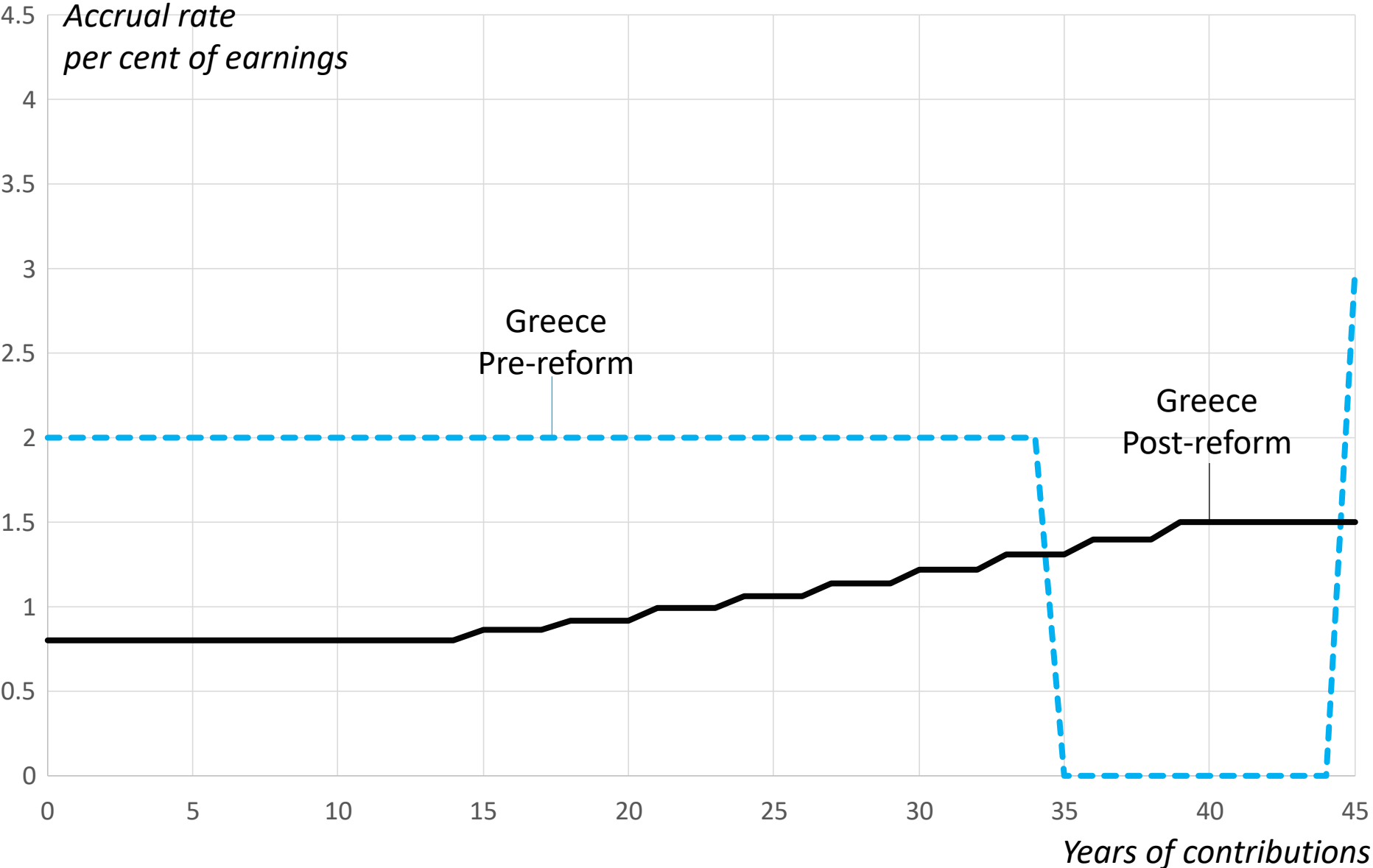


Accrual rate structure
Maximum replacement rate

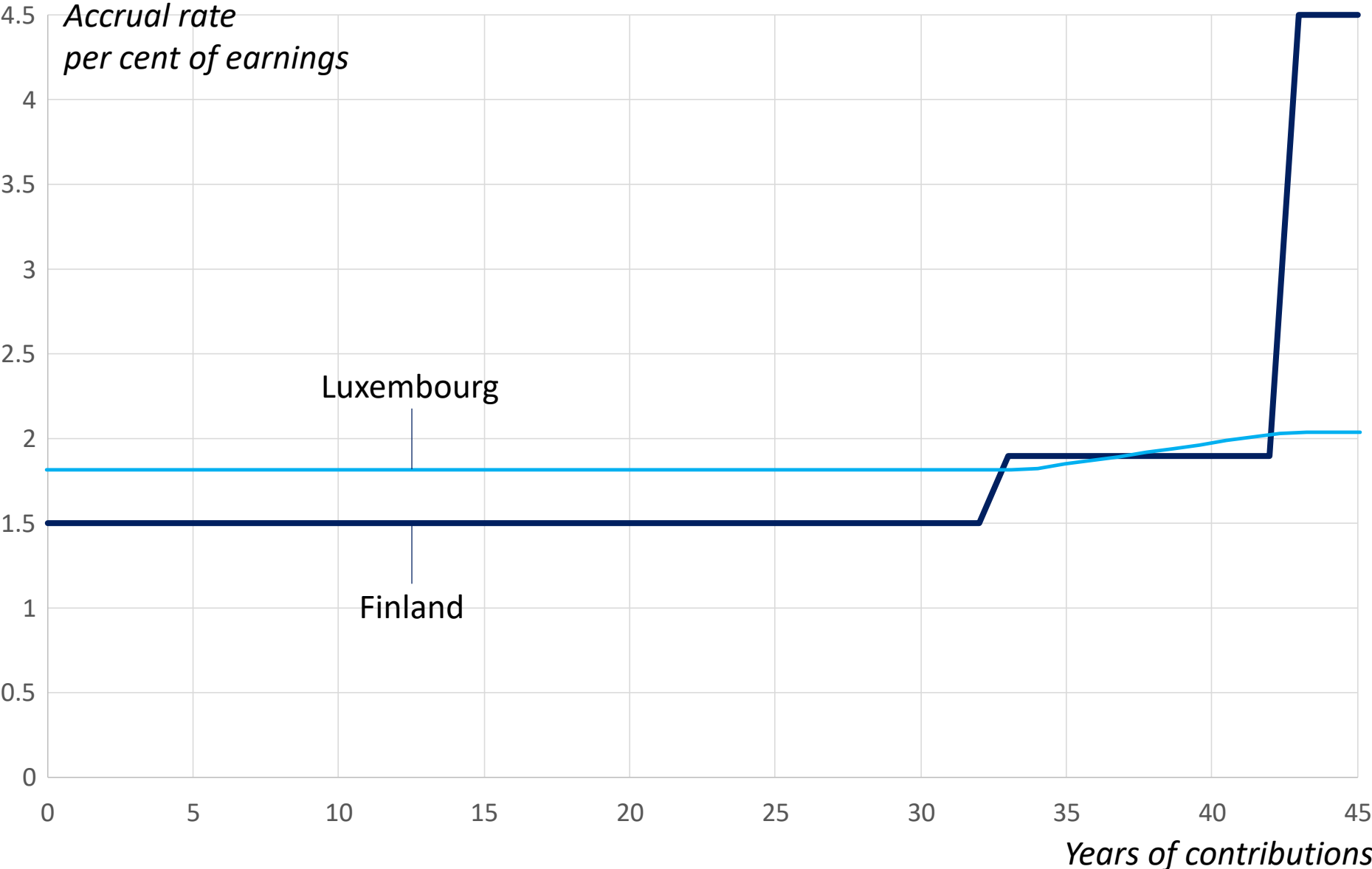
Accrual rates: structure



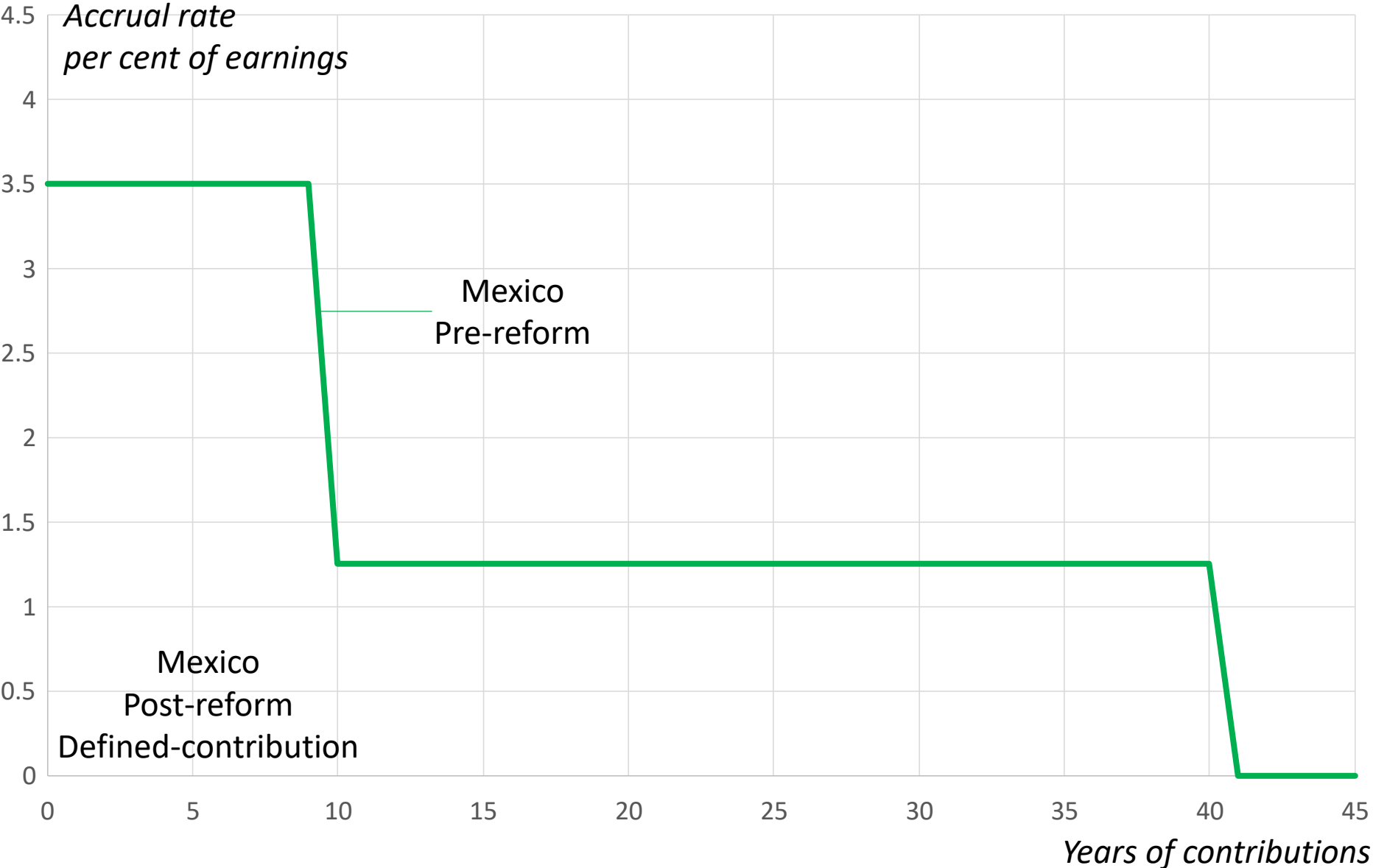
Accrual rates: structure



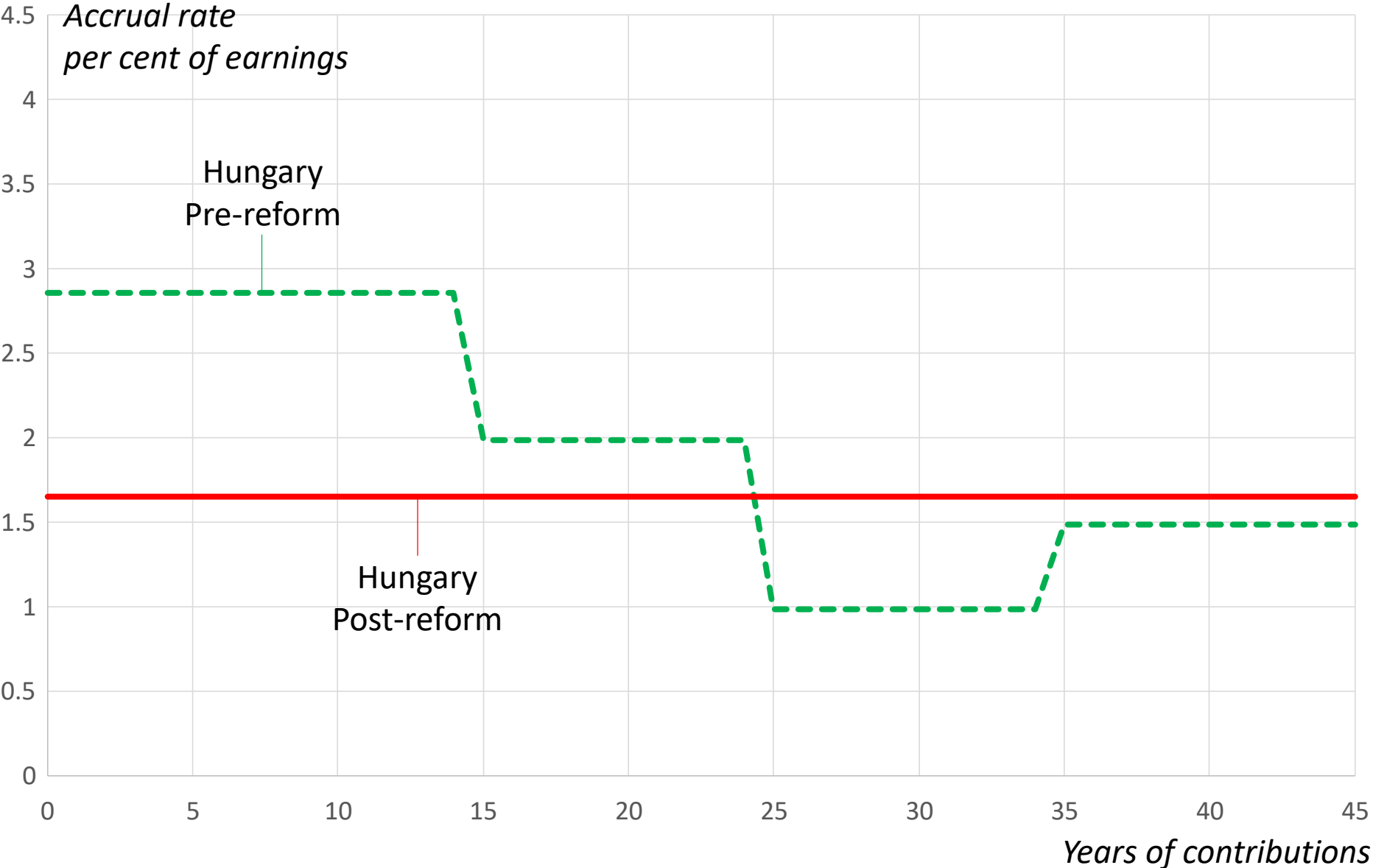
Accrual rates: structure



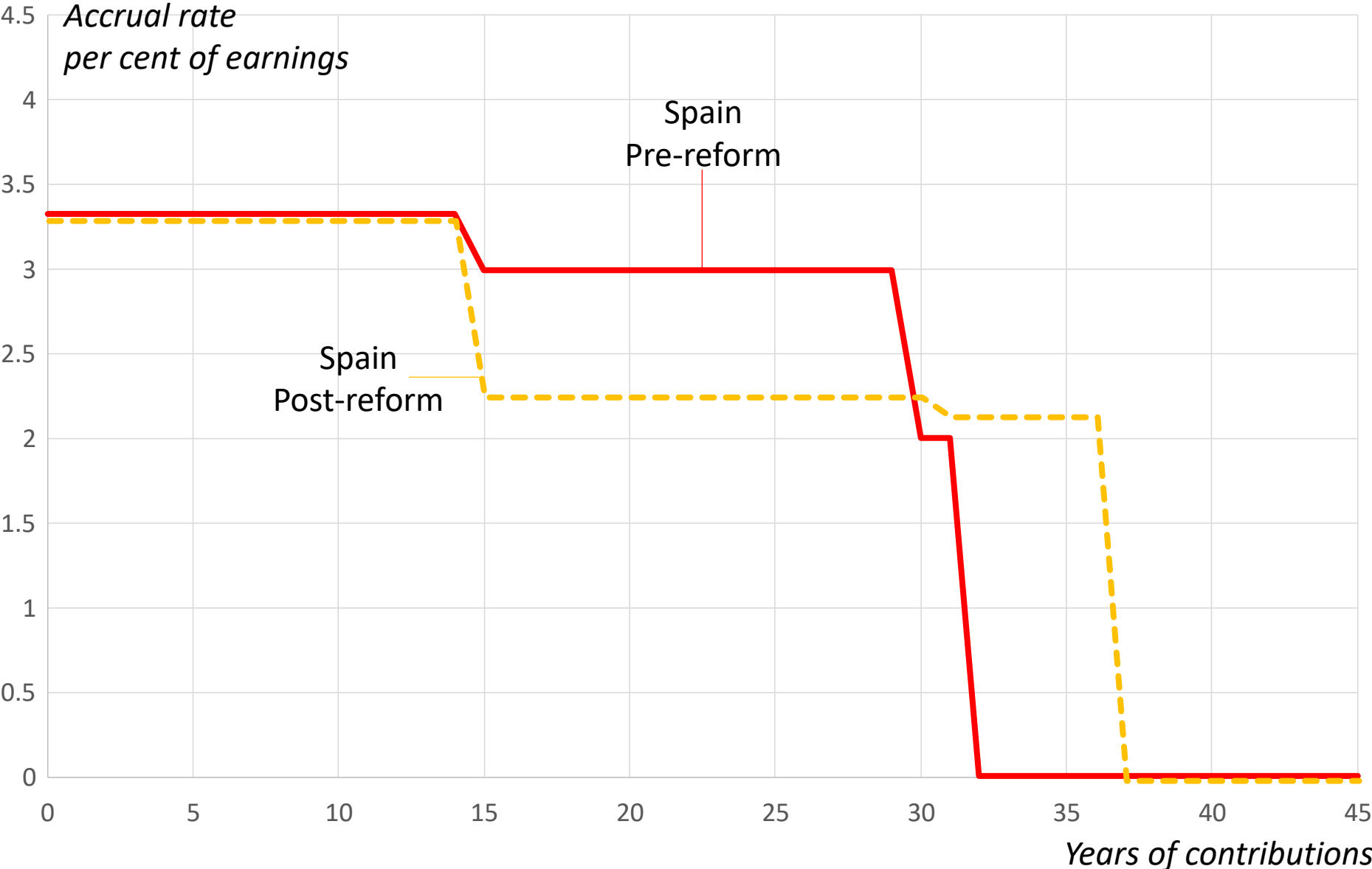
Accrual rates: structure



Accrual rates: structure



Accrual rates: structure



Accrual rates

- Same accrual rate for all years and at all ages is fair
- It is an international norm:
 - 23 out of 27 OECD countries with a public, earnings-related scheme are now linear
 - (8 of 35 OECD countries do not have such arrangements)
- Each extra year of contributions should deliver extra benefit
 - reduce impact of maximum replacement rate

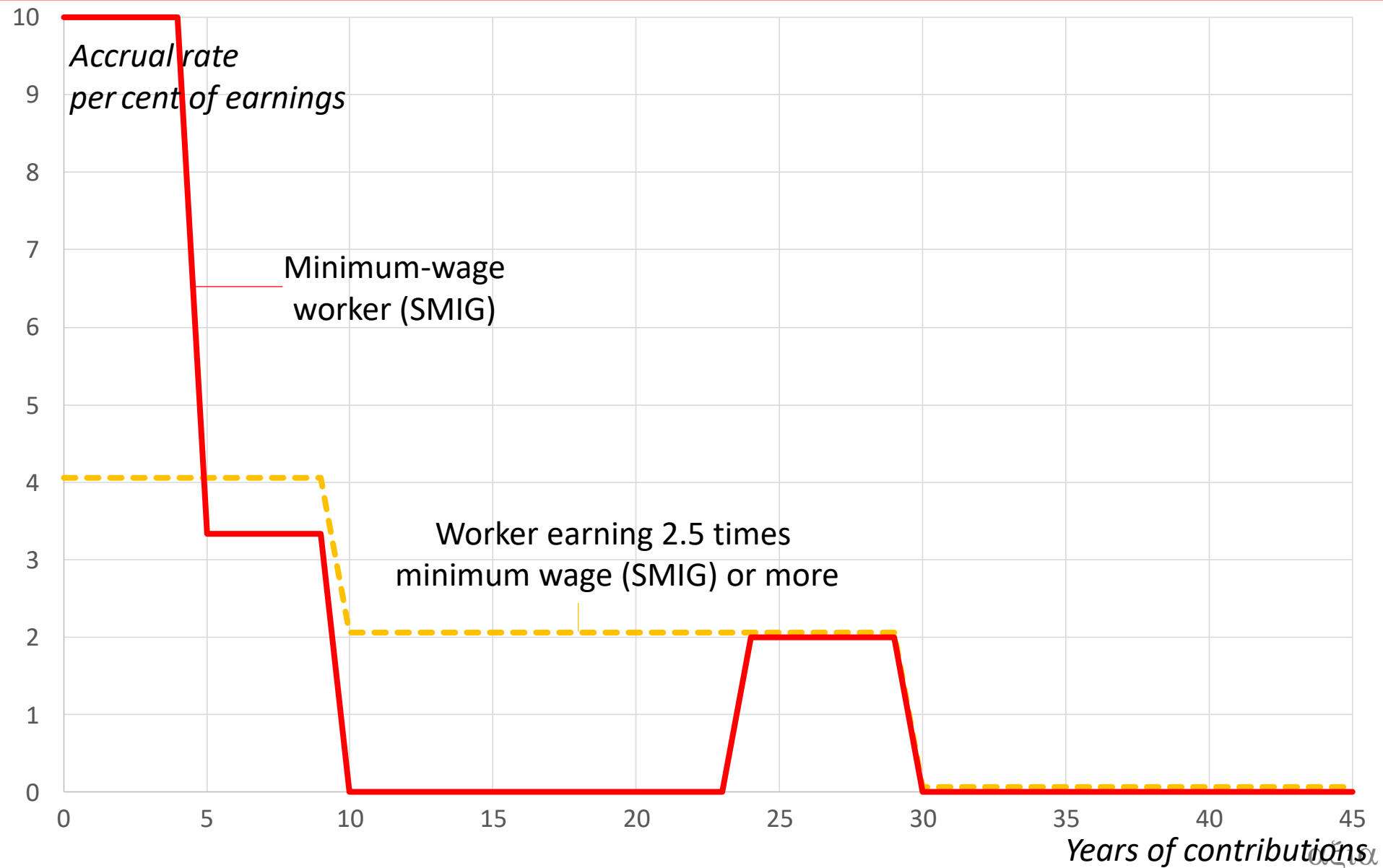
Minimum pension

Interaction with accrual rates

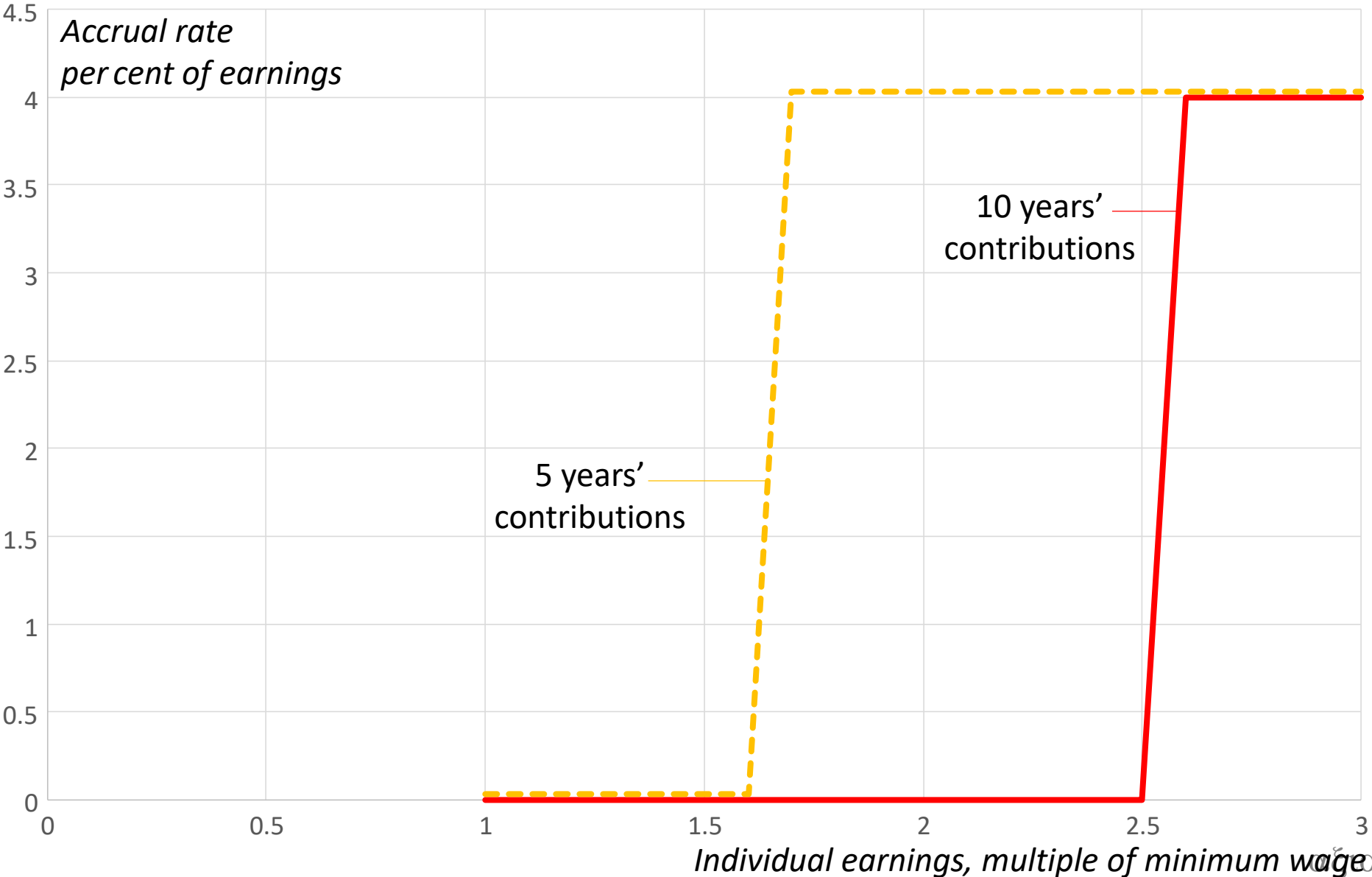
Qualifying conditions



Accrual rates with minimum pensions



Accrual rates by earnings



Contribution years for minimum pension

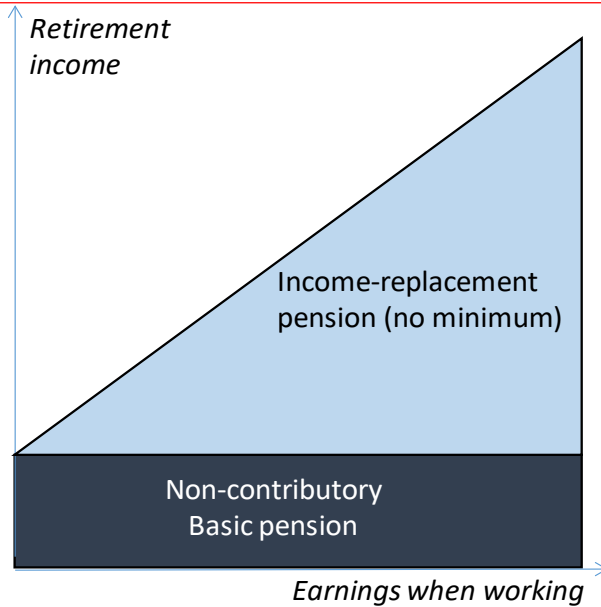
Years	5	10	15	20	25	No minimum
MENA	Tunisia	4	4	3	1	4
AFR	DR Congo	3	16	2	0	25

Alternative approaches

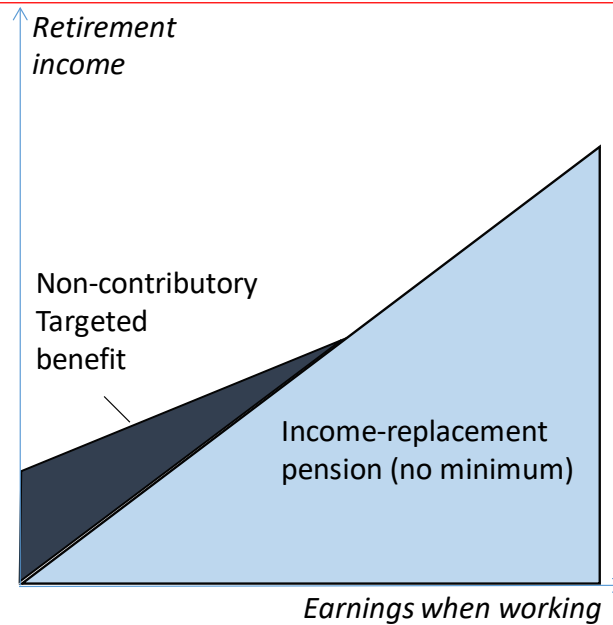
- 23 OECD countries do not have contributory minimum pensions
- Use basic or targeted universal schemes, social assistance to achieve adequacy objectives
- These are fairer than minimum pensions and improve incentives
 - better at achieving adequacy objectives because universal
 - basic scheme means all contributions accrue benefits at all earnings levels
 - targeted schemes often have withdrawal rates of less than 100%, giving low earners some incentive to contribute

Addressing core adequacy: three ways

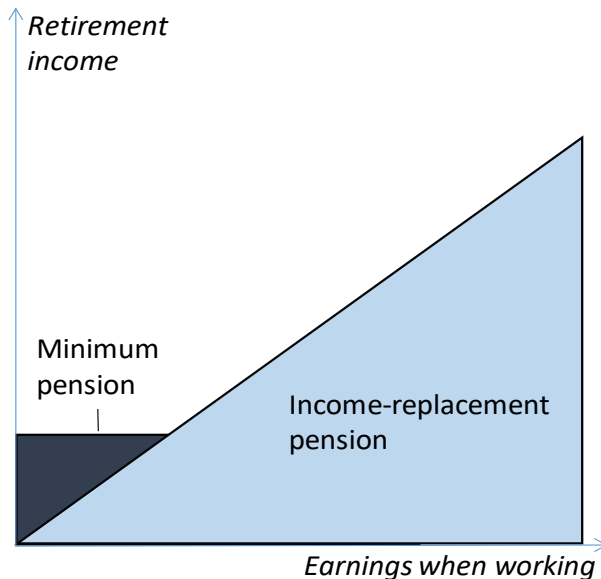
Basic



Targeted



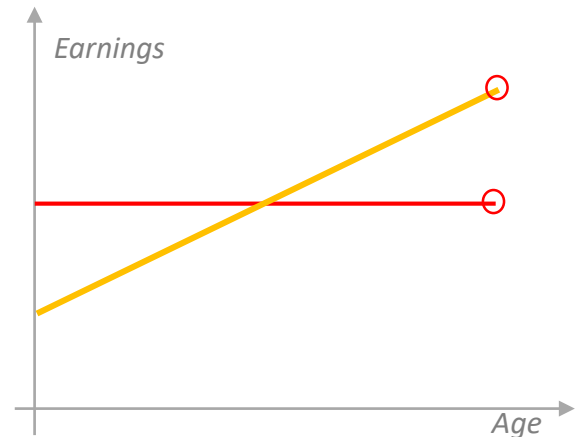
Contributory minimum



Earnings measure

Earnings measure

- Four possible policies:
 - **final** salary: a limited number of the last years' salaries in the career, such as last year, final five years *etc.*;
 - **best** salaries: a limited number of years with highest pay;
 - a **mix** of best and final: e.g., best three in final five salaries;
 - **lifetime-average** salary, using earnings from all years.
- Basing pensions on best or final salary is **unfair**:
 - workers with flat age-earnings profiles lose out
- It is **distortionary**:
 - incentivises people to under-declare earnings in earlier years and over-declare at the career end
 - encourages early retirement when wages have peaked



Earnings measures: OECD

Always lifetime average:

Germany

Hungary

Iceland

Japan

Korea

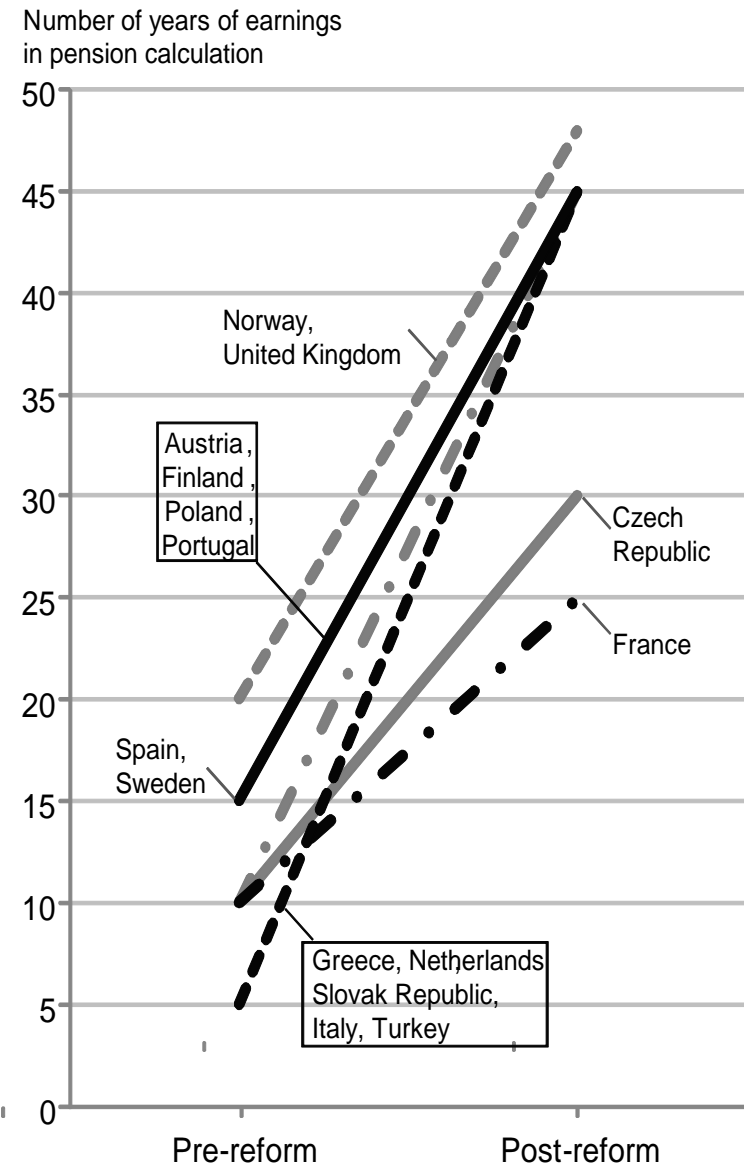
Luxembourg

Switzerland

...or close to lifetime:

Canada (best 83% of years)

United States (35 years)

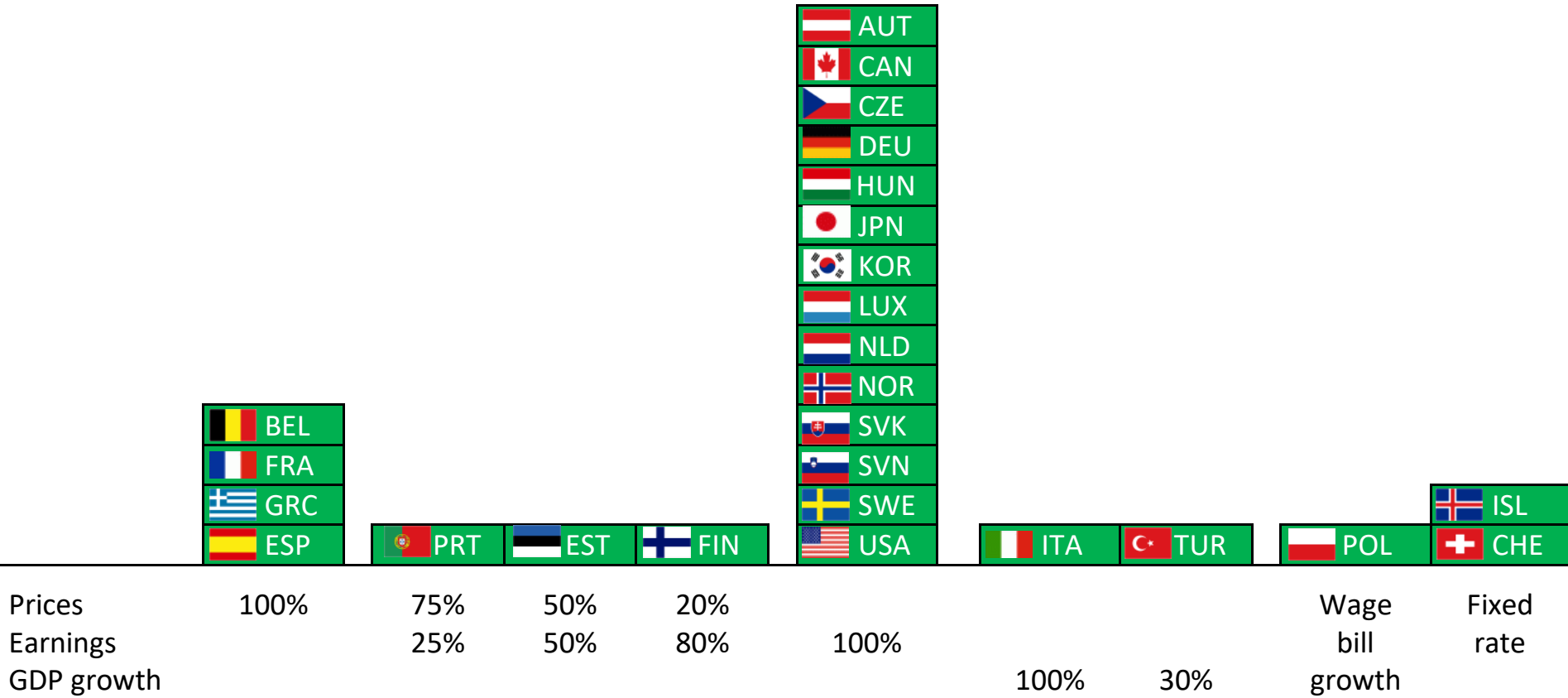


Valorisation

Valorisation policies

- Revaluing earlier years' earnings to wage inflation is **fair**:
 - neutral between earlier and later years
 - replacement rates constant with varying price and wage inflation
- Prices or no valorisation are **unfair** policies:
 - workers with flat age-earnings profiles lose out
 - replacement rates vary arbitrarily with price and wage inflation
- They are **distortionary**:
 - incentivise people to under-declare earnings in earlier years and over-declare at the end of the career

Revaluing earlier years' earnings: OECD



Pension eligibility age

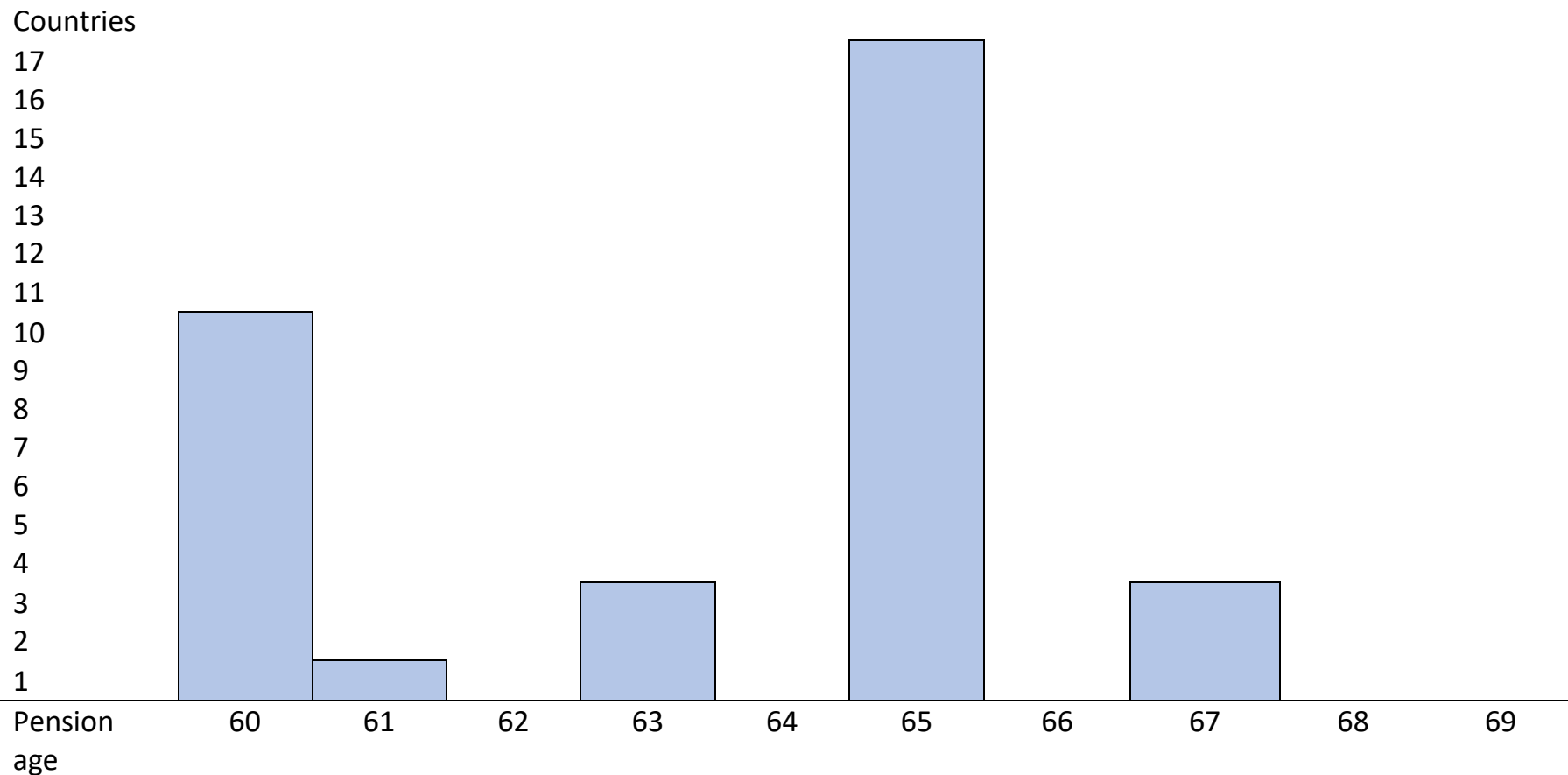
Pensionable age

- No guide from first principles what the *level* of the pension age should be
- But the concept of fairness – equal contributions deliver equal benefits – does show how pension age should *change* over time
- Inter-generational equity

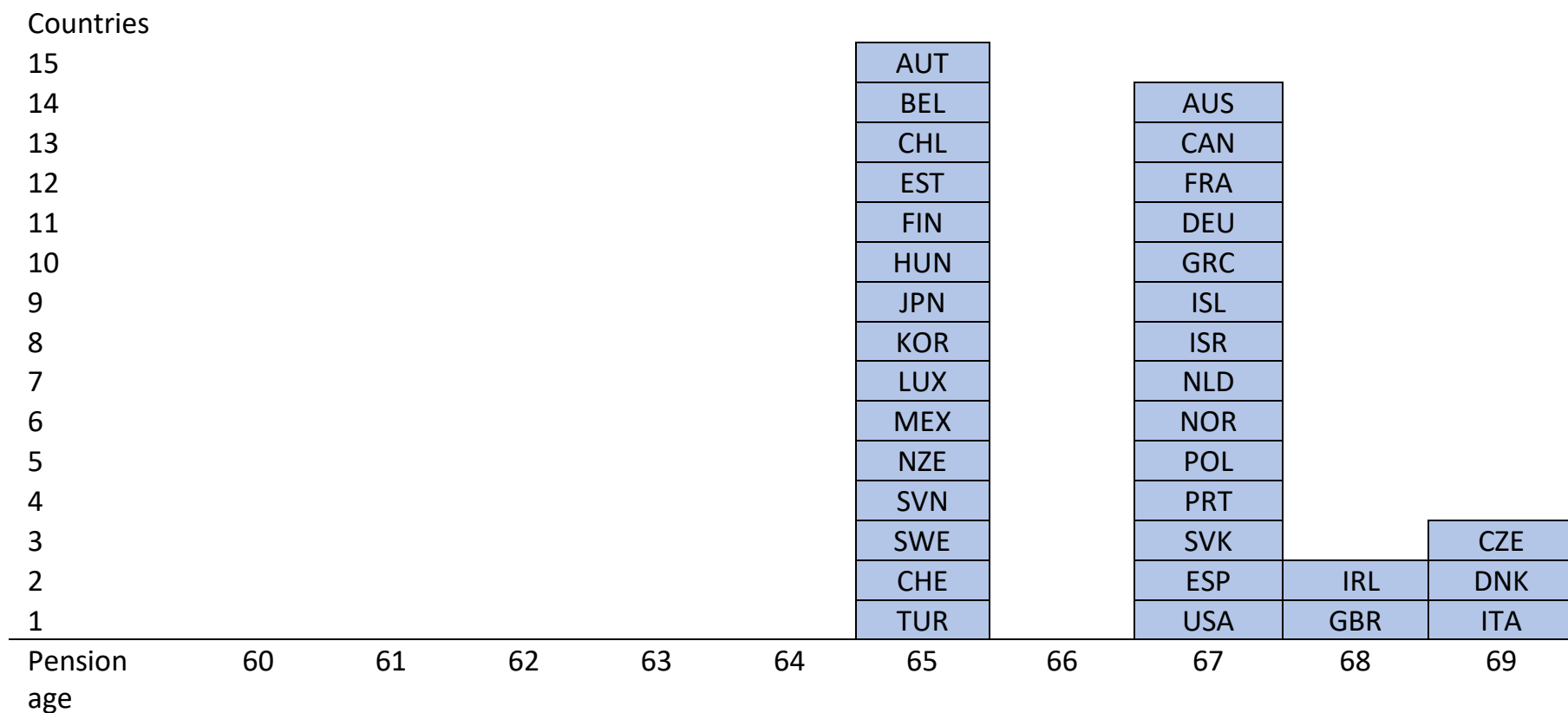
Demographic context: Tunisia

1965-1970	1970-1975	1975-1980	1980-1985	1985-1990	1990-1995	1995-2000	2000-2005	2005-2010	2010-2015
Life expectancy at birth, years									
48.3	54.1	59.4	64.3	67.1	70.3	72.4	73.7	74.6	74.6
Probability of surviving to age 60									
47.9	57.0	64.9	72.0	76.5	81.4	84.9	86.6	87.7	87.7
Life expectancy at age 60, years									
13.9	14.8	15.4	16.5	17.0	17.9	18.7	19.2	19.4	19.5
Probability of a 15-year-old surviving to age 60									
62.2	69.4	74.3	78.8	81.7	85.3	88.2	89.2	89.8	89.8
Life in retirement, per cent of working life									
46.3	49.5	51.2	54.8	56.7	59.8	62.4	63.9	64.7	64.9

Pension ages: retirees in 2000



Pension ages: new entrant in 2015



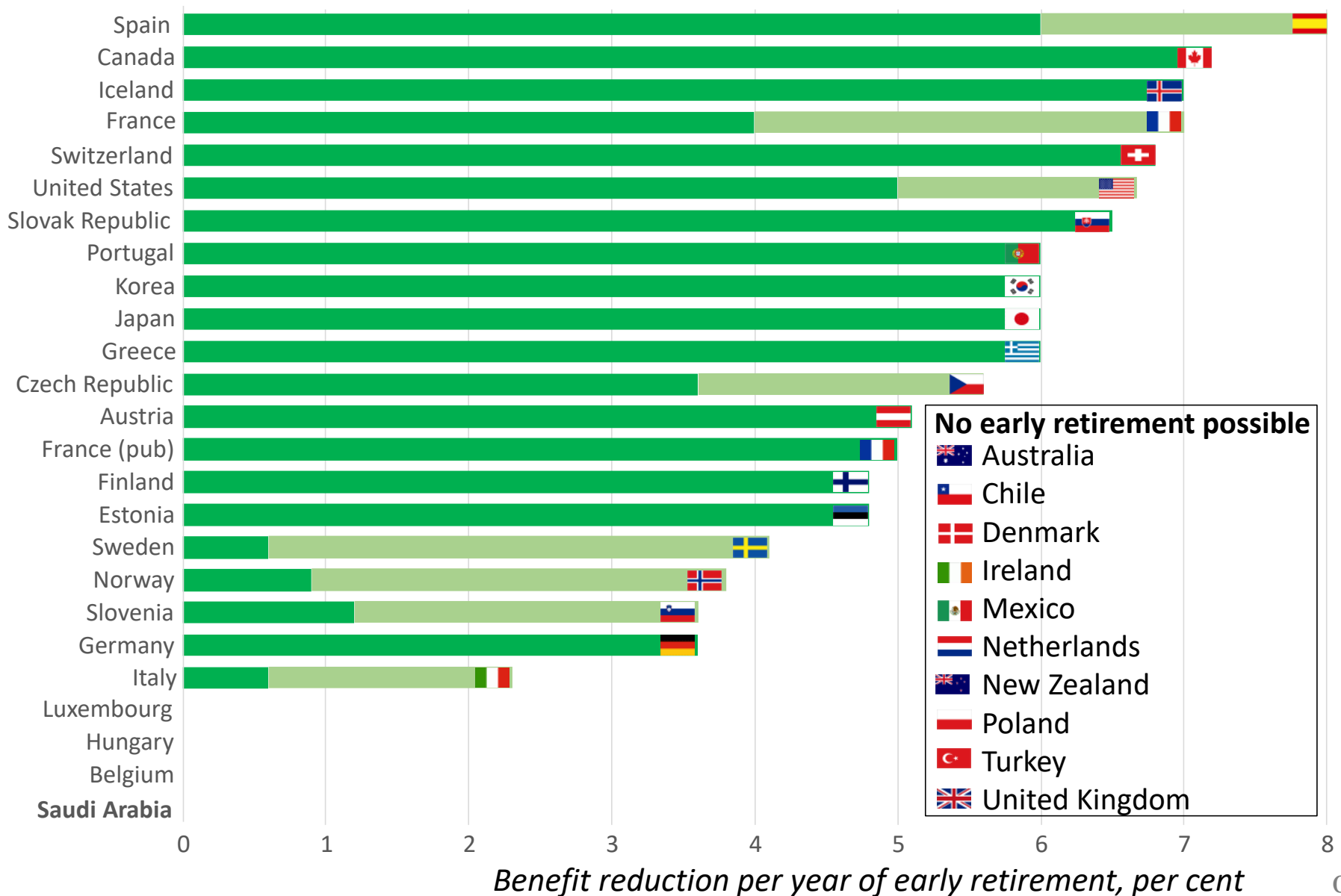
Treatment of early retirees

First principles

- **Actuarial neutrality** should be the goal
- Pension system is **fair** between early and later retirees
- There are no **incentives** to retire early
- Derive actuarially neutral decrements for early retirement
- Tunisia:

Pension withdrawal	50	51	52	53	54	55	56	57	58	59	60
Annuity factor (multiple)	22.0	21.5	20.9	20.4	19.9	19.4	18.9	18.3	17.8	17.2	16.7
Actuarially neutral decrement (%)	4.8	4.9	5.0	5.1	5.3	5.4	5.6	5.8	6.0	6.2	6.4
Cumulative reduction (%)	54.0	49.3	44.4	39.4	34.2	28.9	23.5	17.9	12.1	6.2	0.0

International experience



Uprating pensions in payment

Uprating policies

- **No adjustment**

- real pension value falls in retirement, which might be acceptable if the expected length of retirement is short

- ***Ad-hoc* uprating**

- pensions are increased, but only sporadically, and not linked to changes in prices or wages. Typically, nominal pension value follows the electoral cycle

- **Discretionary increases**

- pensions increased regularly on a fixed time-table: *e.g.* annually. Again, rate of increase not linked to changes in prices or wages

- **Indexation**

- Pensions are increased regularly and automatically, linked to changes in economic variables. Typically, these are indices of prices or average earnings

Indexation

- No benefit uprating, *ad-hoc* changes and discretionary (albeit regular) increases are **unfair**
 - lifetime benefits are arbitrarily lower or higher depending on price inflation and the adjustments that take place
 - also fails to ensure pension adequacy through retirement
- Uprating pensions in payment in line with price inflation is **fair**
 - lifetime benefits the same, relative to individual earnings, at time of retirement, regardless of future price inflation
 - maintains pensions' purchasing power through retirement
- Indexation to economy-wide earnings growth
 - individual pensions remain the same during retirement relative to economy-wide average earnings
 - protects relative living standards

Indexation



Prices 100%

Earnings

80%

20%

67%

33%

50%

50%

40%

60%

-1.6%

-0.75%

100%

Conclusions: Designing earnings-related pensions

Fairness and incentives

- **Accrual rates:** same at all ages and contribution years
- **Maximum replacement rate:** ensure all years count
- **Contributory minimum:** think about social pension instead
- **Earnings measure:** lifetime average salary
- **Revaluation of earlier years' earnings** to calculate benefits: use average-earnings growth
- **Pension eligibility age:** regular reviews so it keeps pace with changes in life expectancy at pension age
- **Benefit adjustment for early retirement:** actuarially neutral reductions
- **Adjustment of pensions in payment:** index pensions to ensure automatic, regular increases preferably in line with price inflation

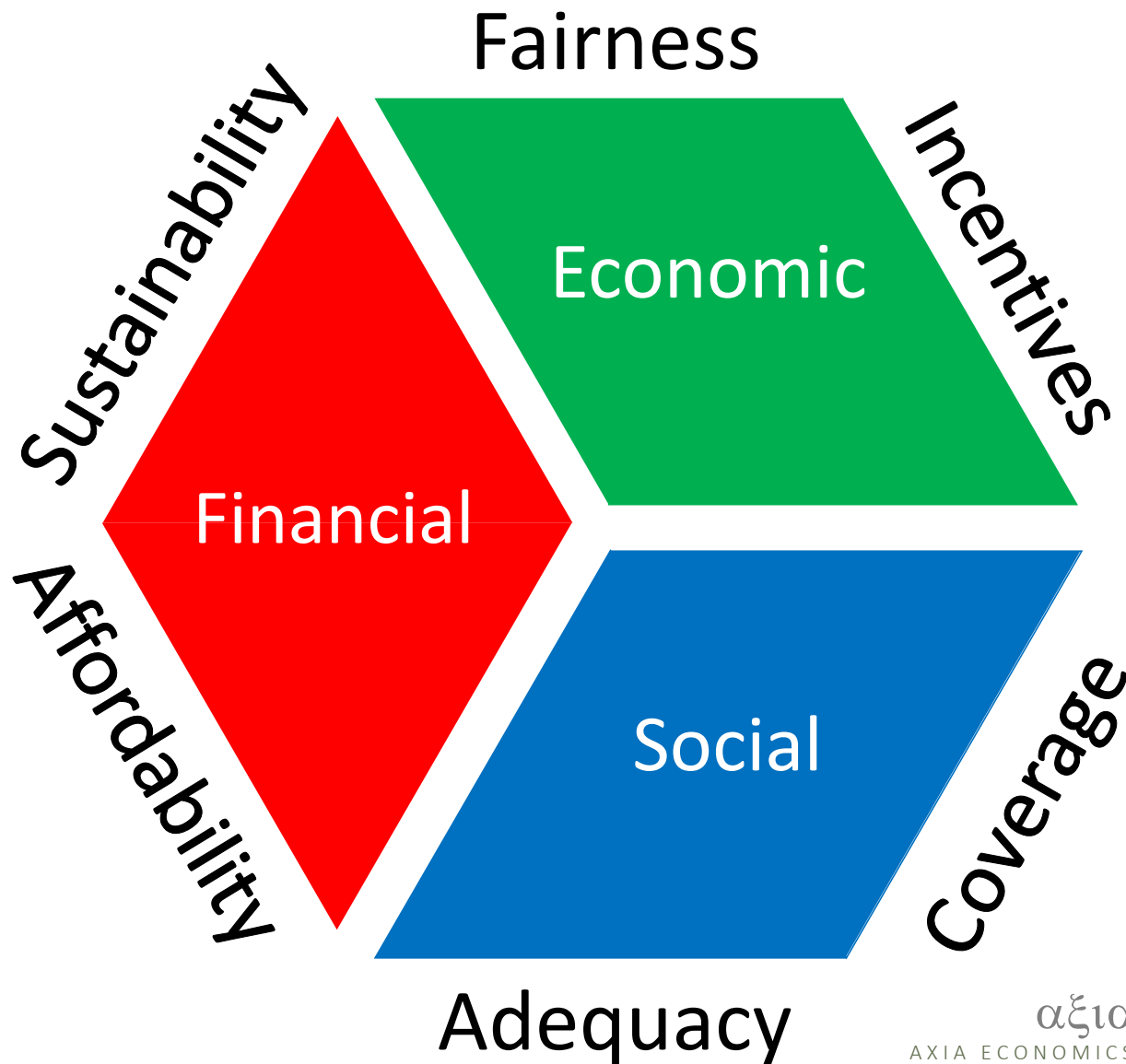
Fairness and incentives

- Fairness between members of different schemes:
 - need to consider differences in accrual rates, contribution rates *etc.* together
- Fairness between covered and uncovered
 - again, think about social pension instead of contributory minimum benefits
 - earnings-related benefits should be self-financing: no permanent subsidy from the general government budget

Final thoughts

- Fairness/incentives analysis leaves three key questions unanswered
 - guidance on **structure** of accrual rates, but not the **level**
 - appropriate **change** in pensionable age, but not its **level**
 - right **structure** of contribution rates, but not their **level**
- These three need to be determined by looking at two other objectives of pension system:
 - financial sustainability/affordability
 - social sustainability: benefit adequacy and coverage

Objectives for the pension system



Pension possibilities

- Three key variables:
 - accrual rate: 2%
 - pension eligibility age: 60
 - contribution rate: 17% total (employer plus employee)
- Look at the sustainable combinations

Pension possibilities

