FINANCIAL MARKETS AND INSTITUTIONS
A.Y. 2024/25
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B13. INSURANCE AND PENSIONS

- WHY INSURANCE? HOW DOES IT WORK?
- WHY PENSIONS? HOW DOES IT WORK?
- A GLANCE AT THE ITALIAN PENSION SYSTEM

WHY INSURANCE?

Future, unpredictable events with adverse financial consequences on communities and/or individuals

First solution: **mutuality**

→ *uncertain individual* exposure is pooled and turns into a *share* of an *uncertain collective exposure*

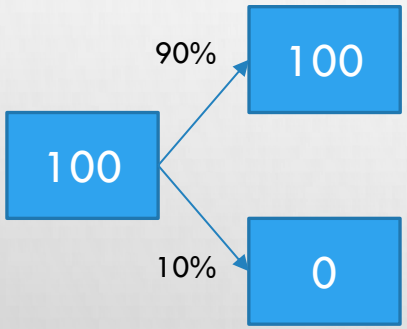
Second solution: **insurance**

→ *upfront cost* (**premium**) in exchange of *indemnity* if a future uncertain event occurs (**claim**)

WHY INSURANCE?

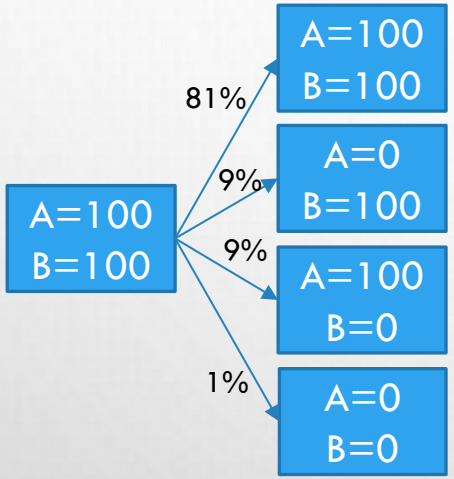
Example:

You own land worth 100. A flood can destroy it. You don't know that *p=10%*



$E(A) = 90$

$\sigma(A) = 30$



$E(A) = 90$

$\sigma(A) = 21$

With 100 exposures?

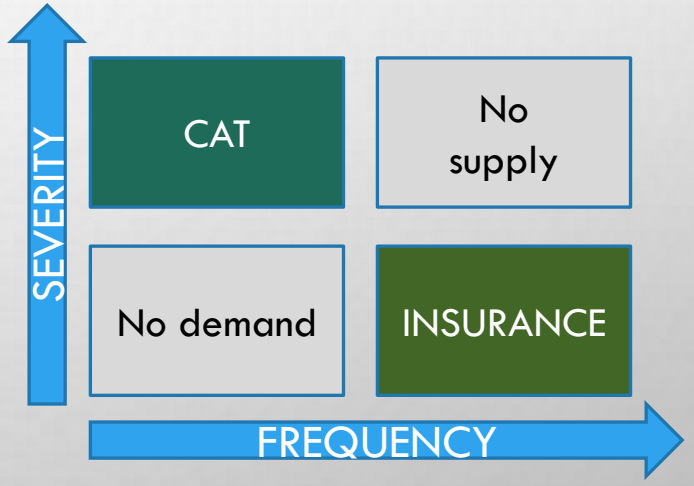
$E(A) = 90$

$\sigma(A) = 3$

With 1000 exposures?

$E(A) = 90$

$\sigma(A) = 0{,}95$

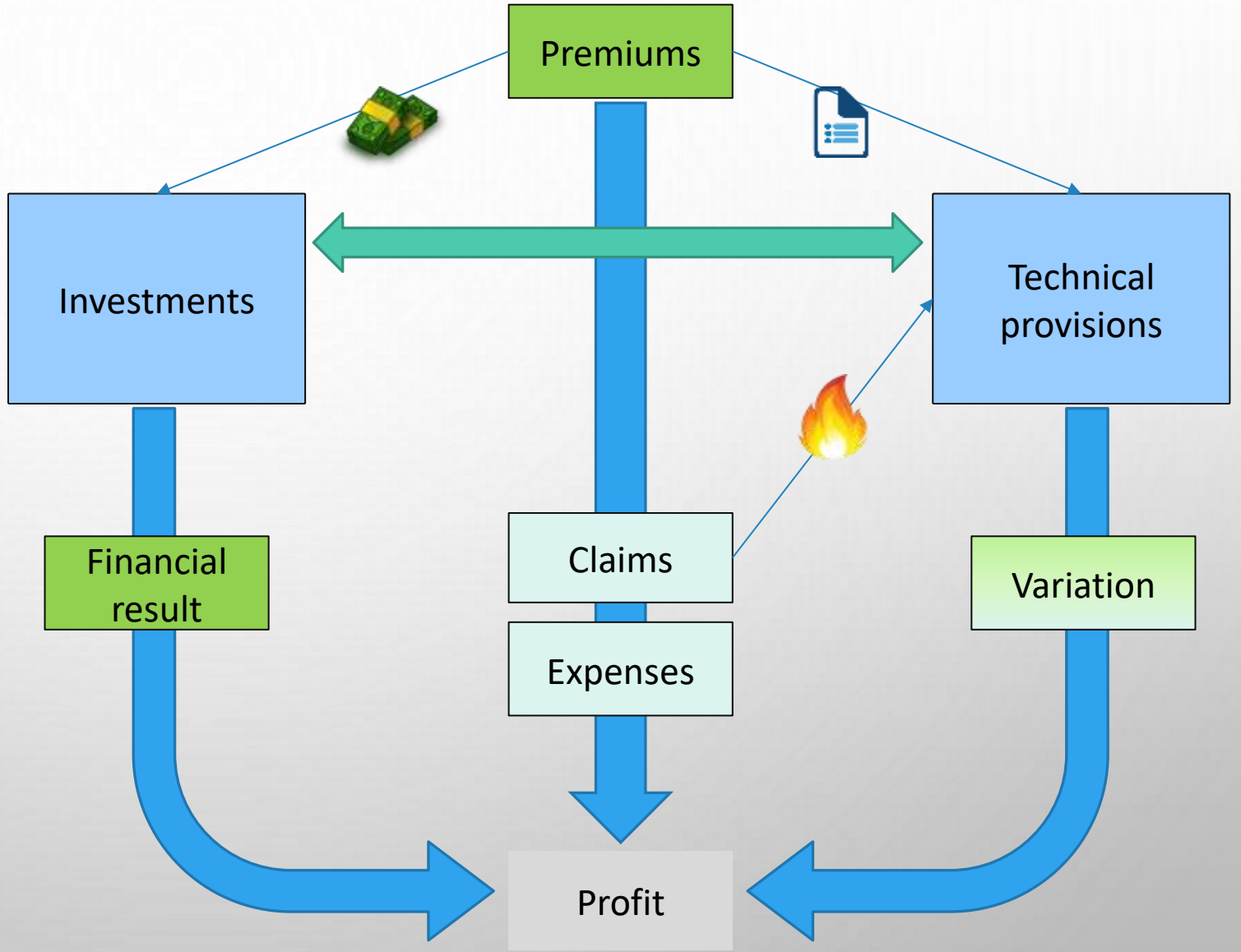


Premium = Frequency × Severity + Cost loadings + Safety loadings

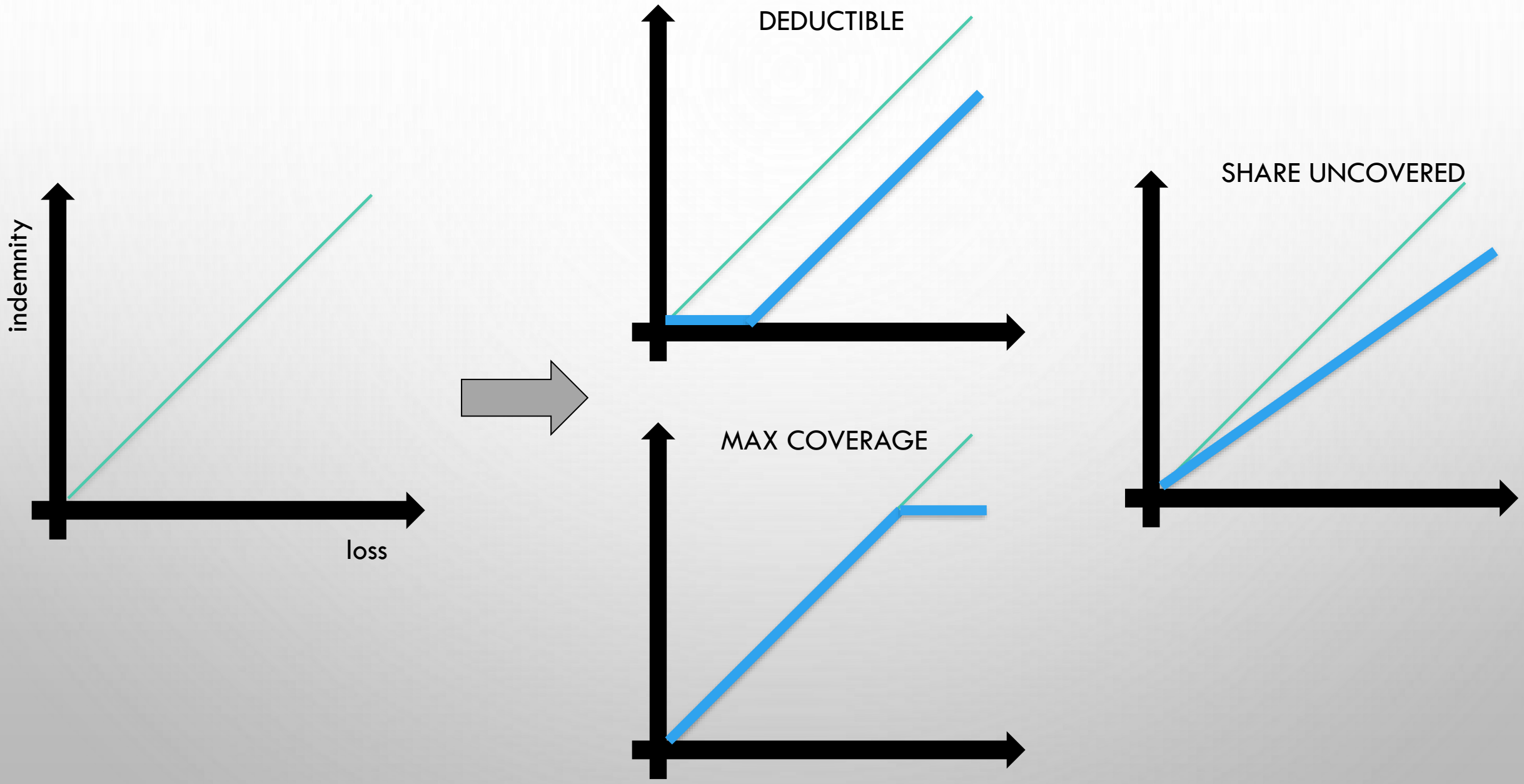
HOW INSURANCE?

Wide asymmetic information issues → principle-based contracts:

- **Insurable interest**
- **Actuarial pricing** and **underwriting** (life vs nonlife discounting)
- **Utmost good faith and indemnity principle**
- **«Covenants»:** exclusions and limitations to indemnities
- **Fraud** prevention
- **Self-insurance** and **risk-sharing**



HOW INSURANCE?



WHO INSURANCE?

Table 1.2
Non-Life: overall ranking of European insurance groups*
(ranking by insurance revenue, millions of euros)

	Group	Country	2023	2022r**	2023–2022 change	Share
1	ALLIANZ	Germany	68,757	63,963	7.5%	19.9%
2	AXA	France	51,296	49,876	2.8%	14.9%
3	ZURICH	Switzerland	41,588	38,615	7.7%	12.1%
4	TALANX	Germany	34,170	31,059	10.0%	9.9%
5	GENERALI	Italy	30,498	28,141	8.4%	8.8%
6	MAPFRE	Spain	20,478	19,163	6.9%	5.9%
7	ERGO	Germany	16,757	15,442	8.5%	4.9%
8	GROUPAMA	France	13,644	12,547	8.7%	4.0%
9	AVIVA	United Kingdom	12,564	11,790	6.6%	3.6%
10	BUPA	United Kingdom	12,386	11,771	5.2%	3.6%
11	VIENNA GROUP	Austria	10,300	9,056	13.7%	3.0%
12	R+V	Germany	9,275	8,749	6.0%	2.7%
13	UNIPOL	Italy	8,947	8,000	11.8%	2.6%
14	SAMPO GROUP	Finland	7,535	7,277	3.5%	2.2%
15	MUTUA MADRILEÑA	Spain	6,764	6,132	10.3%	2.0%
	First 5 total		226,309	211,654	6.9%	65.6%
	First 15 total		344,959	321,582	7.3%	100.0%

Table 1.3
Life: overall ranking of European insurance groups
(ranking by insurance revenue, millions of euros)

	Group	Country	2023	2022r*	2023–2022 change	Share
1	AXA	France	29,593	30,572	-3.2%	20.3%
2	ALLIANZ	Germany	22,589	23,114	-2.3%	15.3%
3	GENERALI	Italy	18,979	16,997	11.7%	11.3%
4	CNP[1]	France	10,198	10,717	-4.8%	7.1%
5	ZURICH	Switzerland	10,169	9,550	6.5%	6.3%
6	TALANX	Germany	10,009	9,925	0.8%	6.6%
7	AVIVA	United Kingdom	7,951	7,979	-0.4%	5.3%
8	LEGAL & GENERAL	United Kingdom	7,604	6,713	13.3%	4.4%
9	CRÉDIT AGRICOLE ASSURANCE	France	7,287	7,415	-1.7%	4.9%
10	NATIONALE-NEDERLANDEN	Netherlands	6,584	6,389	3.1%	4.2%
11	SWISS LIFE	Switzerland	6,457	5,586	15.6%	3.7%
12	BNP[1]	France	5,423	5,472	-0.9%	3.6%
13	MAPFRE	Spain	4,303	3,554	21.1%	2.4%
14	M&G	United Kingdom	3,720	3,447	7.9%	2.3%
15	ERGO	Germany	3,342	3,454	-3.2%	2.3%
	First 5 total		91,529	90,950	0.6%	60.3%
	First 15 total		154,209	150,884	2.2%	100.0%

WHO INSURANCE?

INSURANCE MARKETS/INSTITUTIONS

Life insurance:

- Risks: **death**, **superannuation, long-term health**
- Offering term/whole life, LTC, annuities and products with **financial features** (unit/index linked, …)
- **Long-term investor, frequently with AM features**

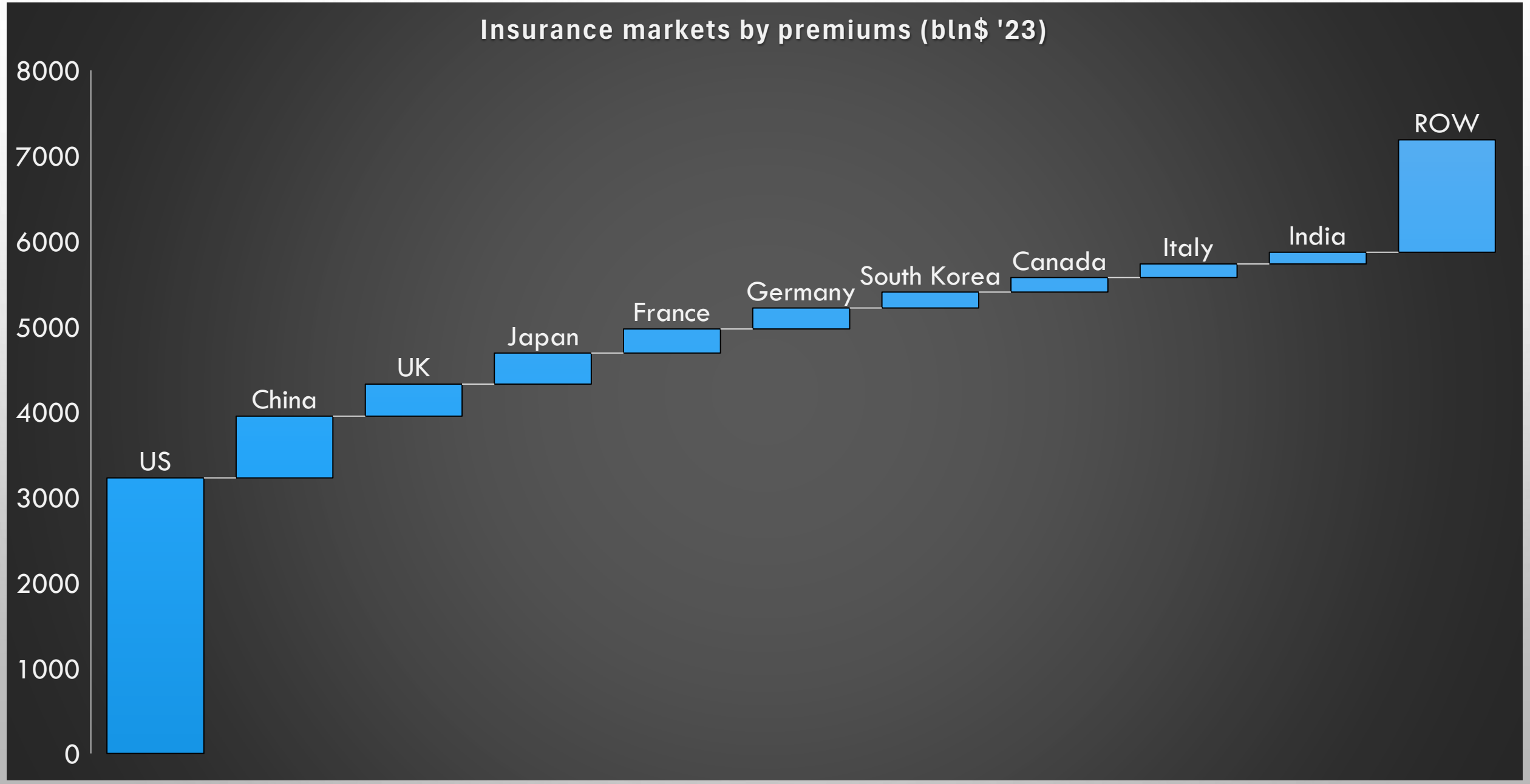
Non-life insurance:

- Risks: loss of **wealth** and **liability**
- **Events are recurring** and **difficult to estimate**
- Offering frequently multiple guarantees (property, liability) but also credit insurance, protection from lawsuit's costs and assistance
- **Short-term, liquid investor**

Reinsurance:

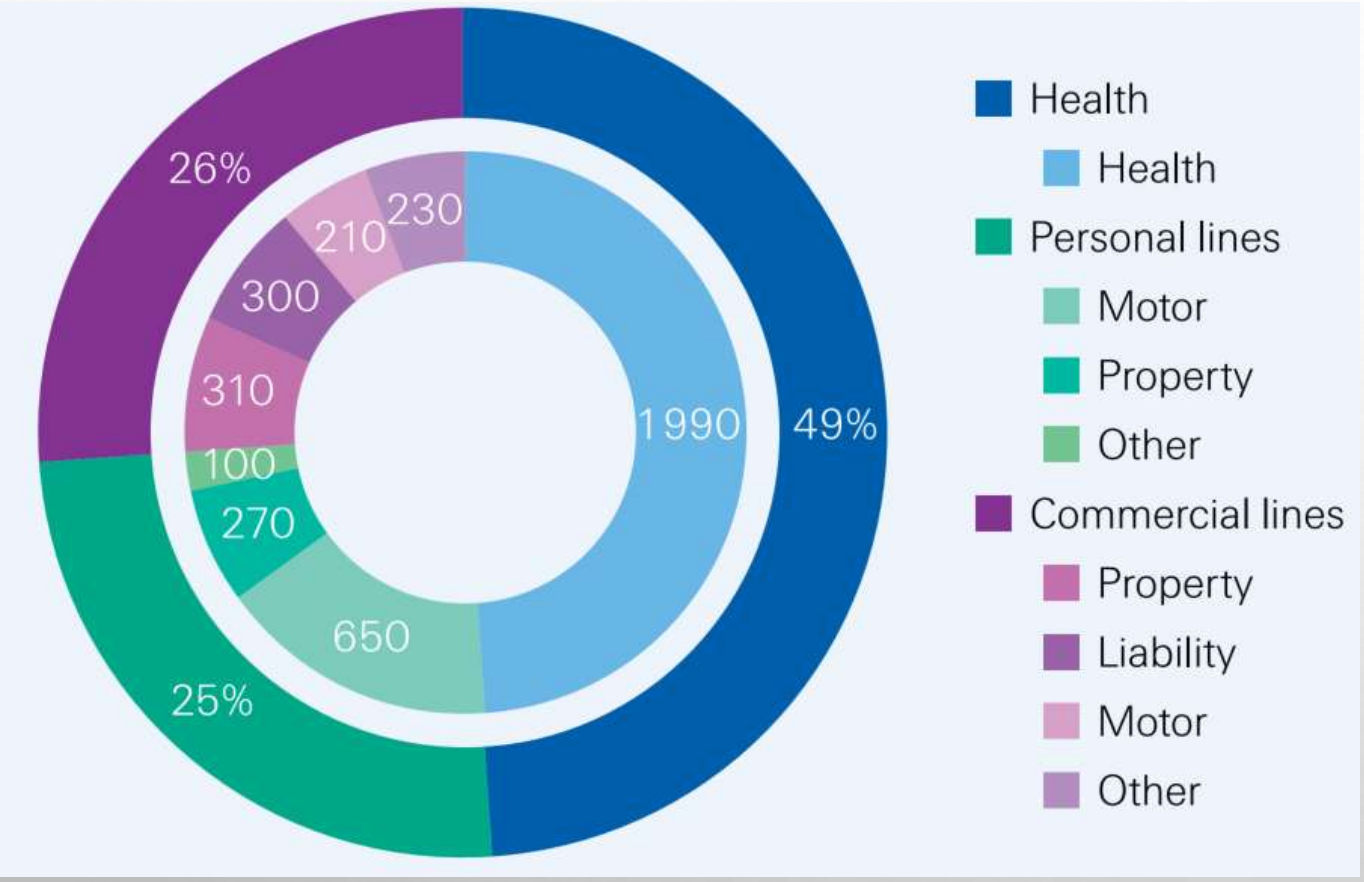
- Insurance bought by insurers (complex B2B contracts/treaties
- Mostly non-life, especially MAT
- Purposes: loss stabilization, capital capacity, protection from CAT, expertise and entry/exit from markets

INSURANCE MARKETS/INSTITUTIONS



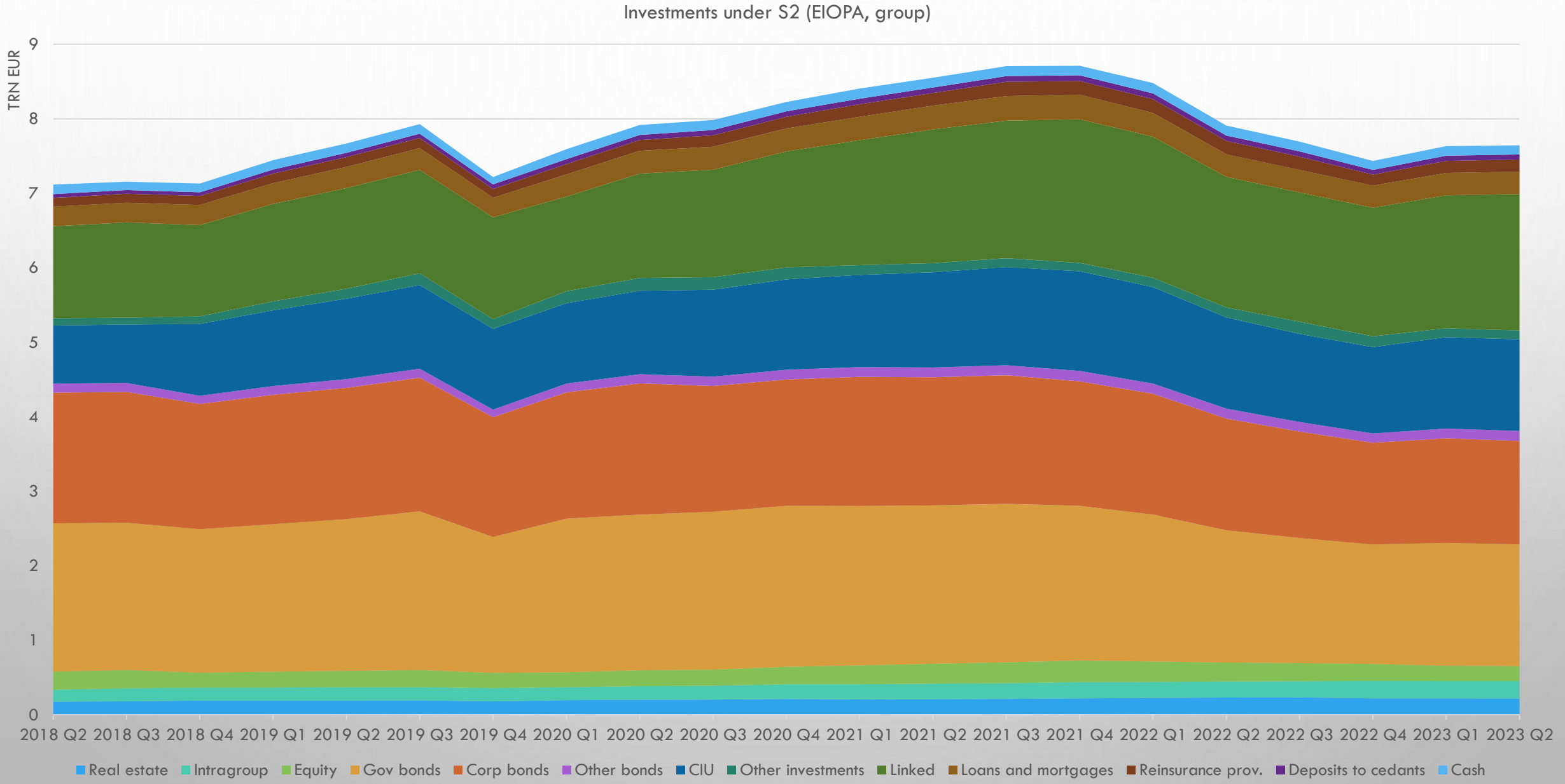
INSURANCE MARKETS/INSTITUTIONS

Global non-life market share and volumes by LoB, 2022 (USD bln)



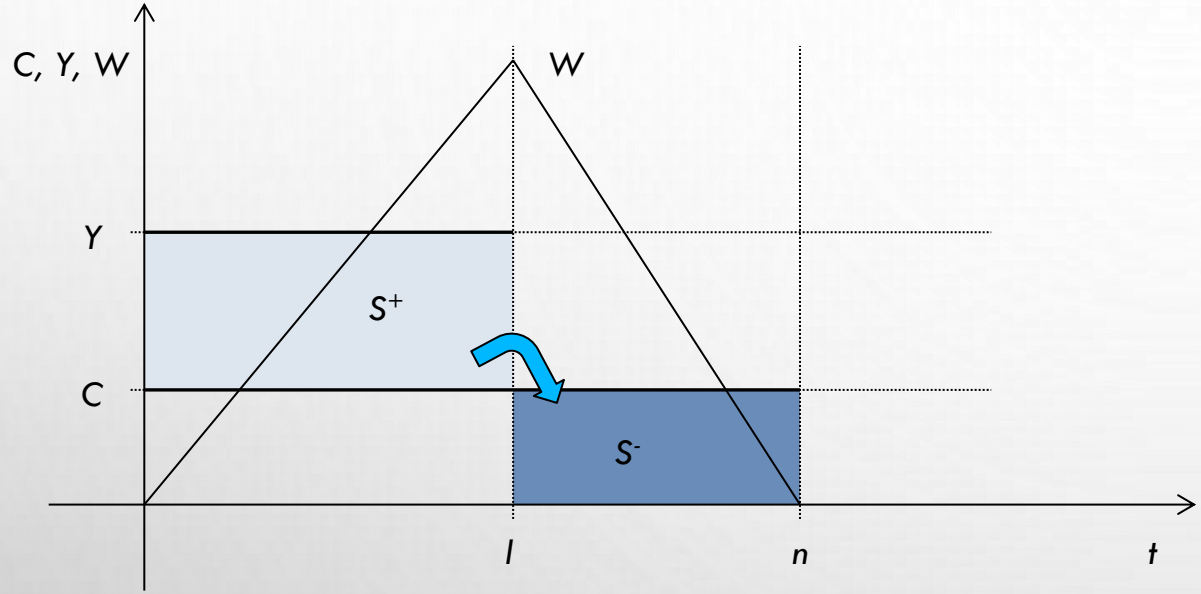
Global life premiums and growth by LoB, 2022 (USD bln)

INVESTMENTS IN INSURANCE



WHY PENSIONS?

Income and consumption are not stable: demographic and financial risks



- "life cycle"
- savings highest at mid-age
- people consume flat annuities of their wealth
- several behavioural constraints in planning for own life cycles

- Need for income after retirement + protection from uncertainties (health, inflation, unemployment, …)
- Long cumulation phases, pension funds are very large institutional investors
- Pension funds similar to mutual funds, but with constraints on liquidity and frequently with tax incentives

HOW PENSIONS?

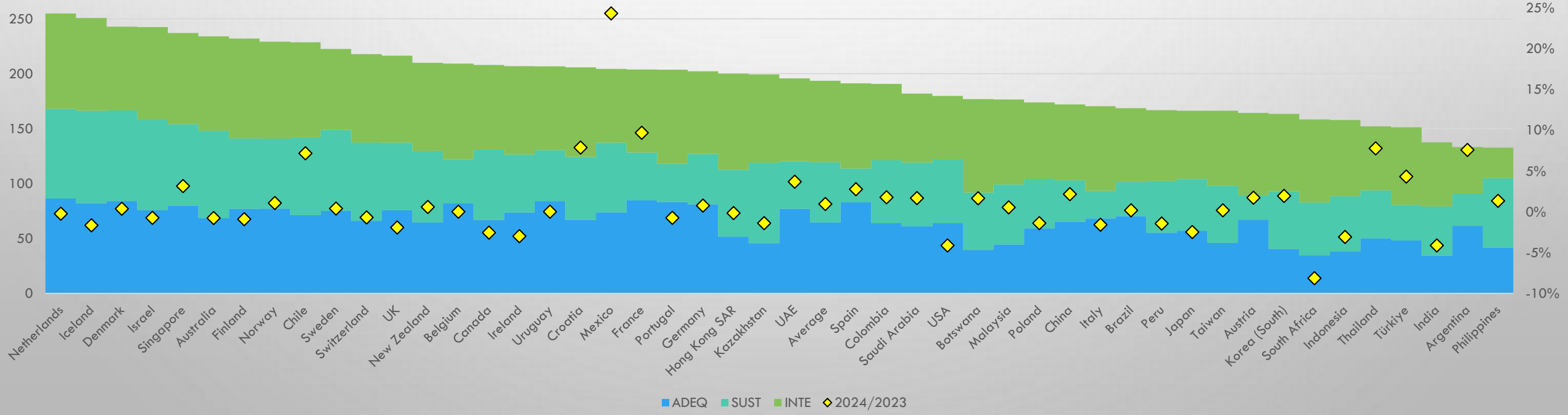
Don’t get confused!

- The funding structure: Pay as you go (PAYG) vs Funded
- Models of funded pensions: Defined benefit VS Defined contribution
- The calculation method: Retribution- vs Contribution-based pensions

Public funds are mostly **PAYG** and **mandatory**

Private funds are funded, mostly DC (but DB is still relevant) and **voluntary**

Mercer/CFA pension index (2024)



HOW PENSIONS?

Risks of PAYG systems:

LABOUR MARKET AND DEMOGRAPHY

PUBLIC BUDGET AND DEMOGRAPHY

$$average\ pension \times retired = \\ = average\ contribution \times workers$$

$$\text{average pension} = \frac{rate\ of\ contributions \times wages \times employed \times tax\_transfer}{dependency\_rate \times retired}$$

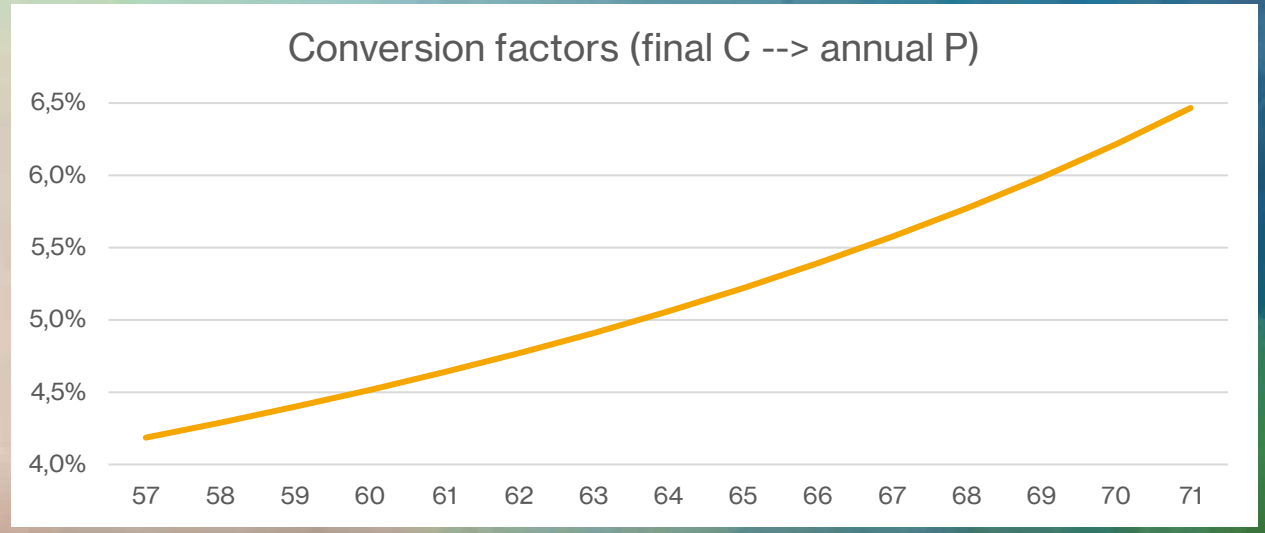
DEMOGRAPHY

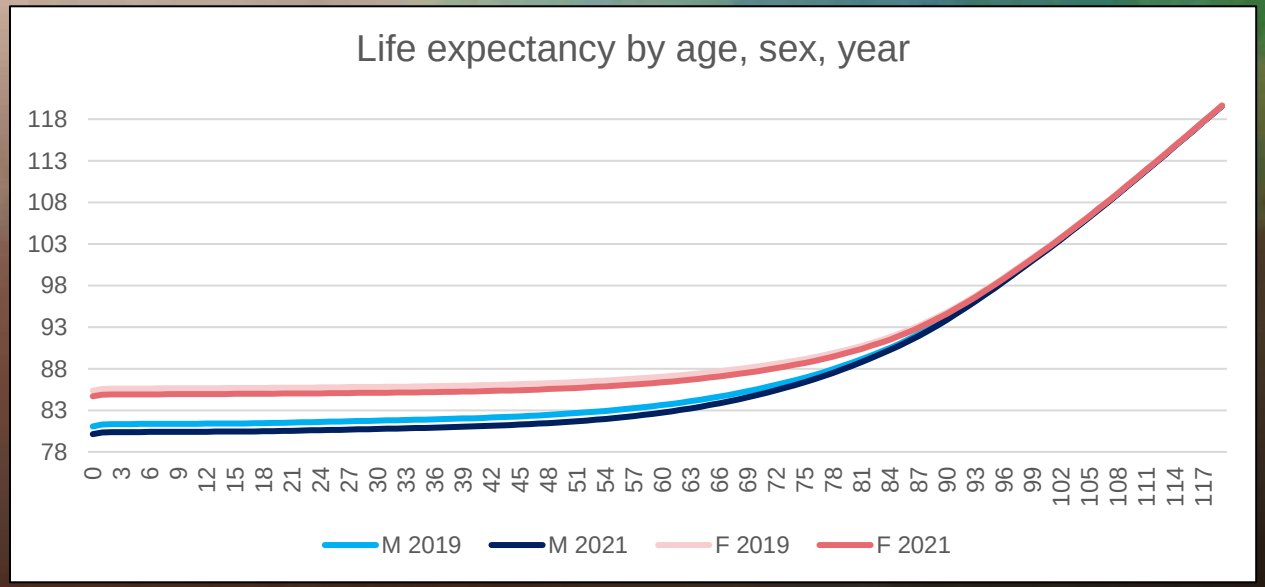
Risks of funded systems:

- Demographic (annuity conversion)
- Financial (returns on contributions, inflation)
- Responsibility → individuals: financial literacy + long term planning

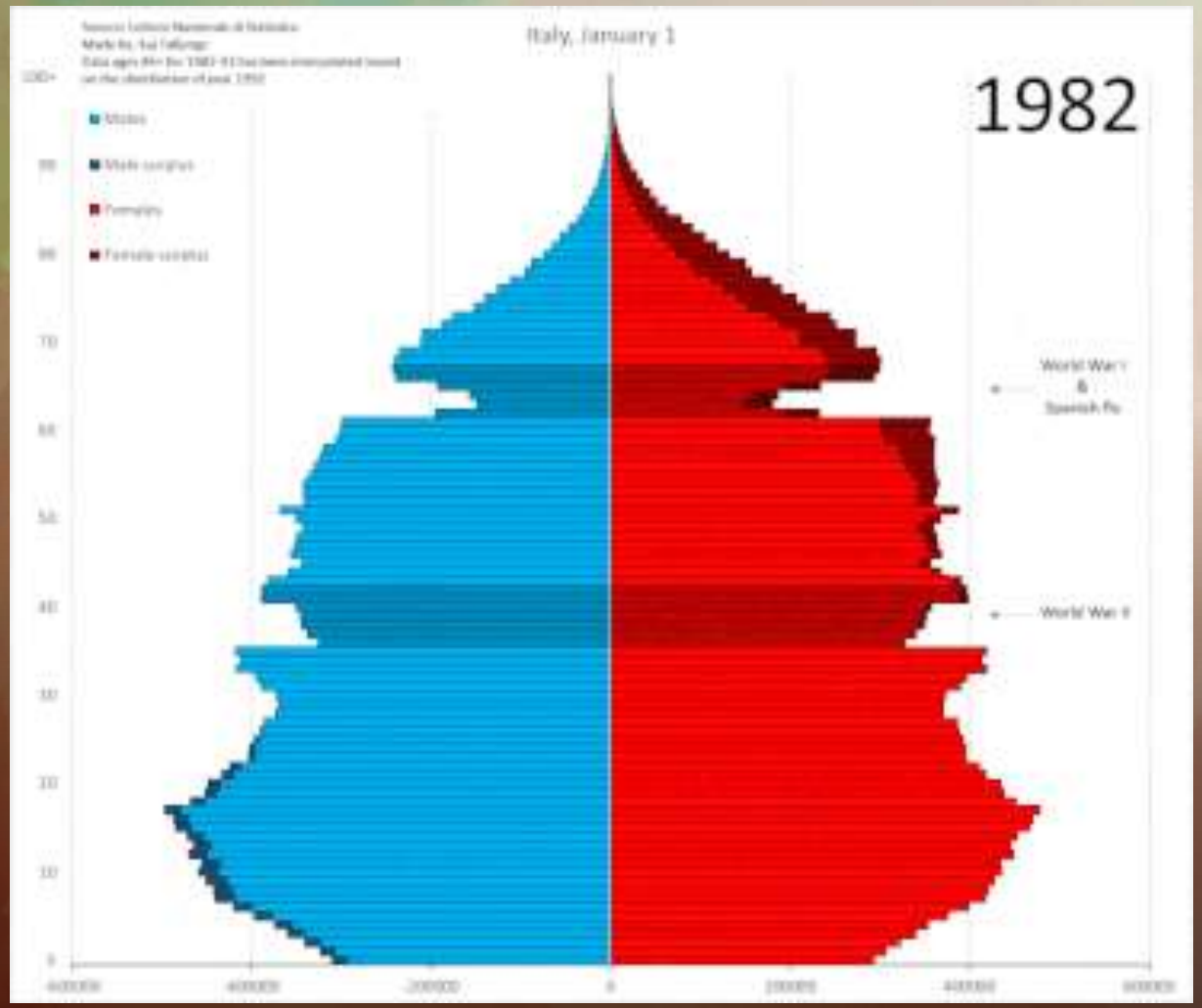
Endless reforms, «difficulties» since late 1980s:

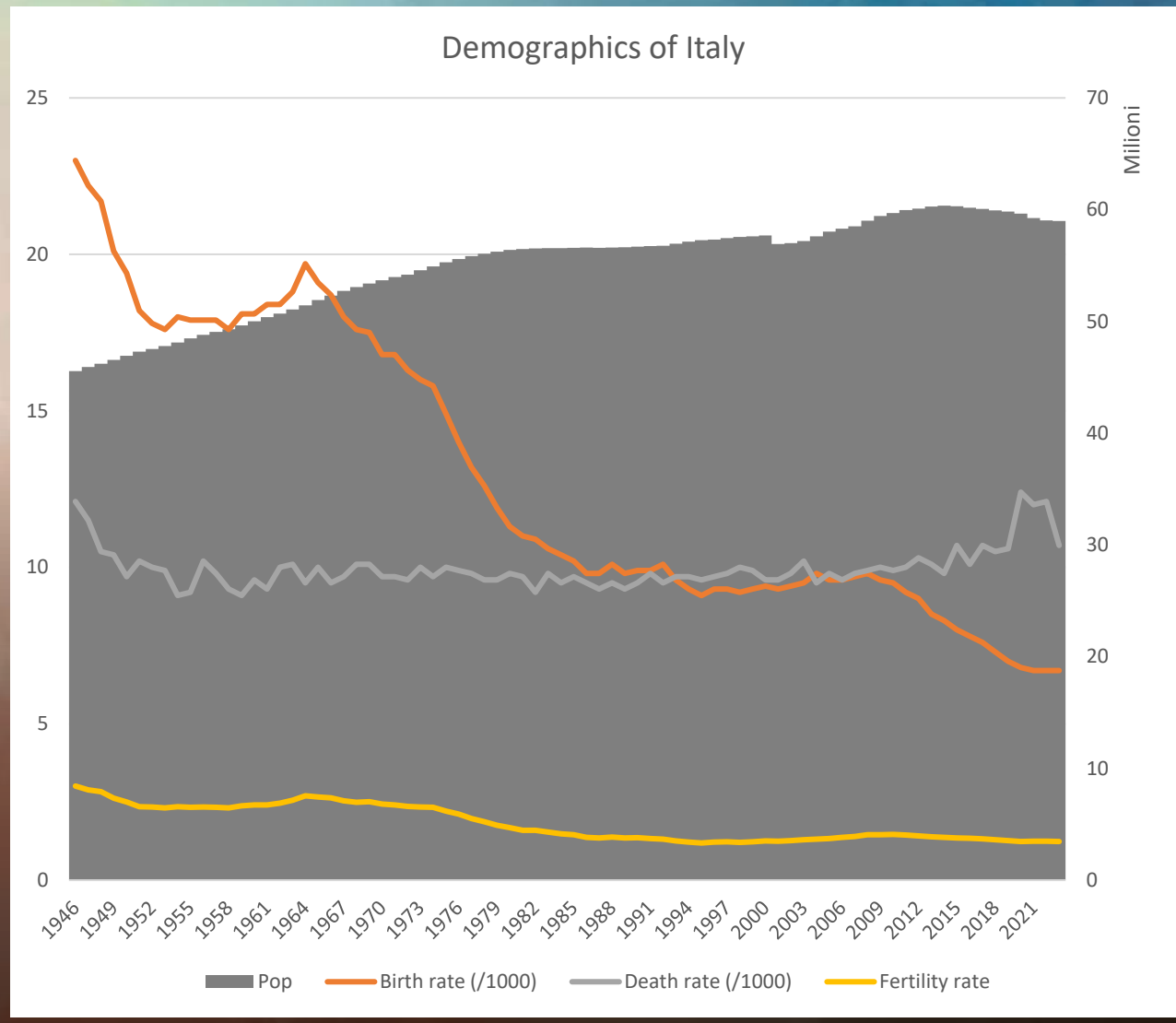
- now entirely **contribution-based** (with transition)
- Progressively **aligning requirements** between genders, public/private sector, employees and self-employed (yet not between/within generations)
- Progressively **removing or penalising early retirement**
- **Retirement age** linked to life expectancy (67 today, expected to be 69 in 2050, but effective age is now 63)
- Contributions **compounded at the nominal 5-year GDP growth** (2,31% in 2023, hit zero in 2014 and 2021)
- **Replacement rates vary** widely (average around 70% in the long run on a net-net basis): huge impact of individual salary/careers/age





A GLANCE AT THE ITALIAN PAYG SYSTEM





A GLANCE AT THE ITALIAN PAYG SYSTEM

Chart 44: Life distribution channels (% of GWP) — 2019

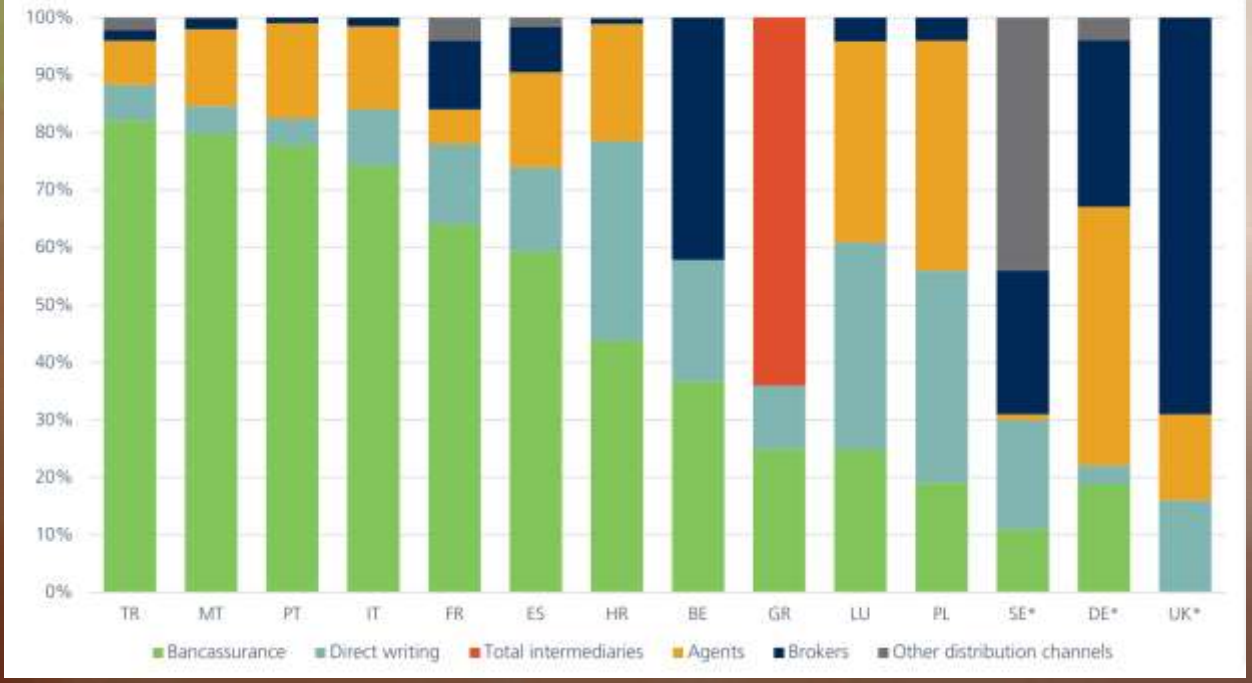
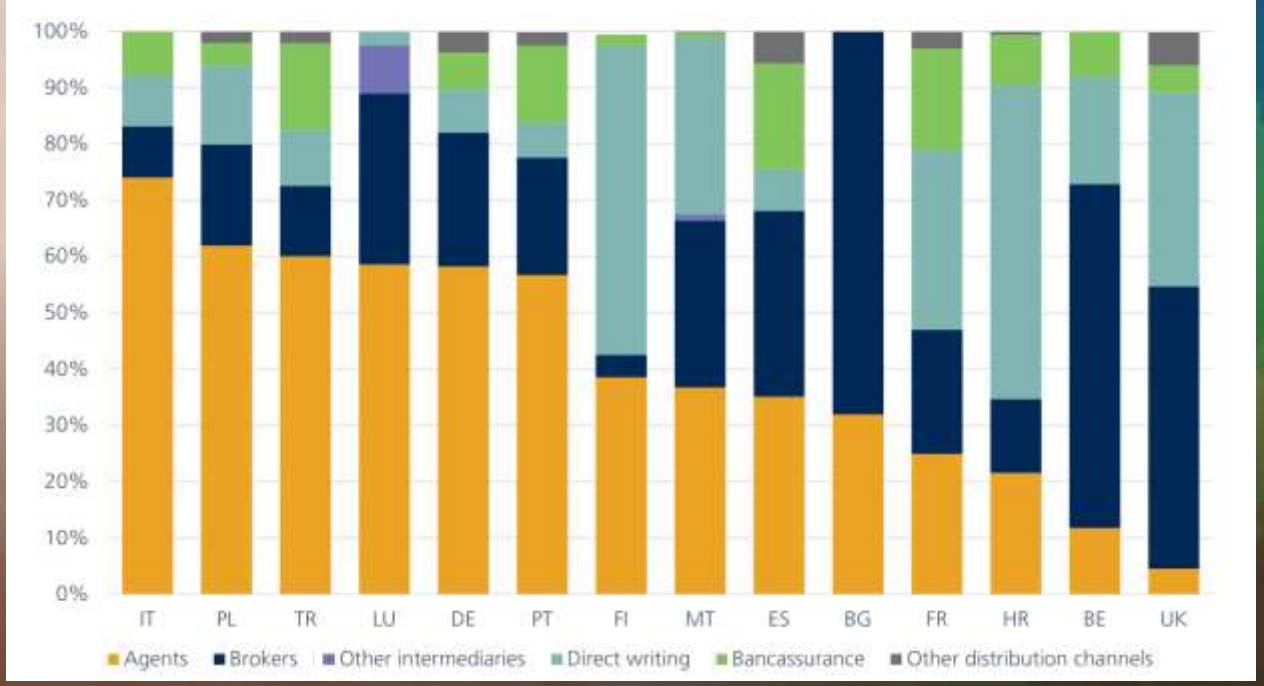
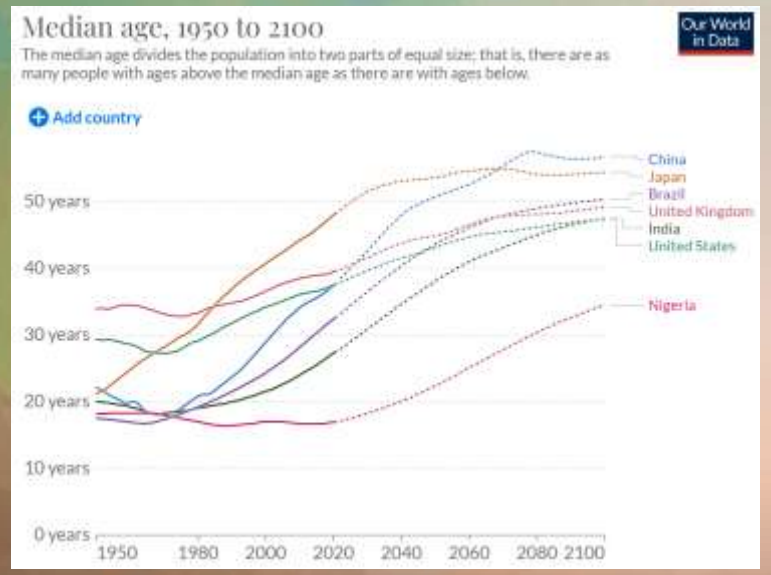


Chart 45: Non-life distribution channels (% of GWP) — 2019



EXAMPLES


Median age, 1950 to 2100
The median age divides the population into two parts of equal size: that is, there are as many people with ages above the median age as there are with ages below.
Our World in Data
Add country
China
Japan
Brazil
United Kingdom
India
United States
Nigeria
50 years
40 years
30 years
20 years
10 years
0 years
1950
1980
2000
2020
2040
2060
2080
2100

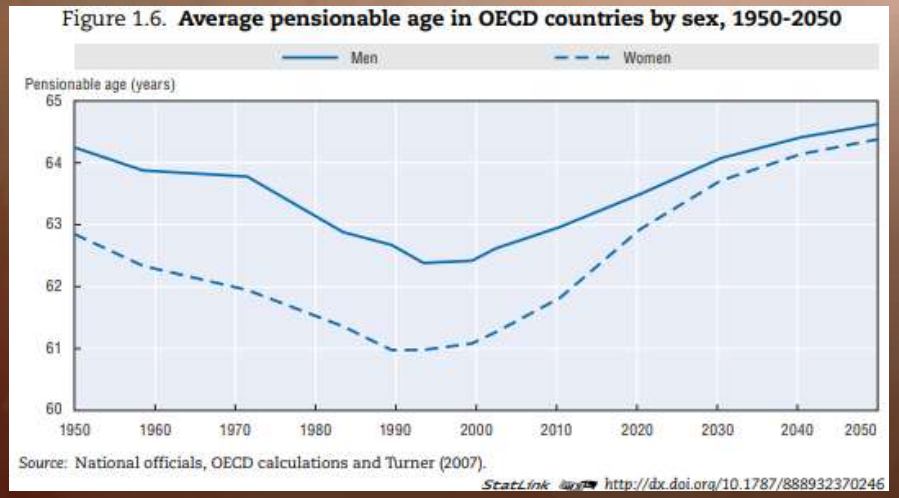
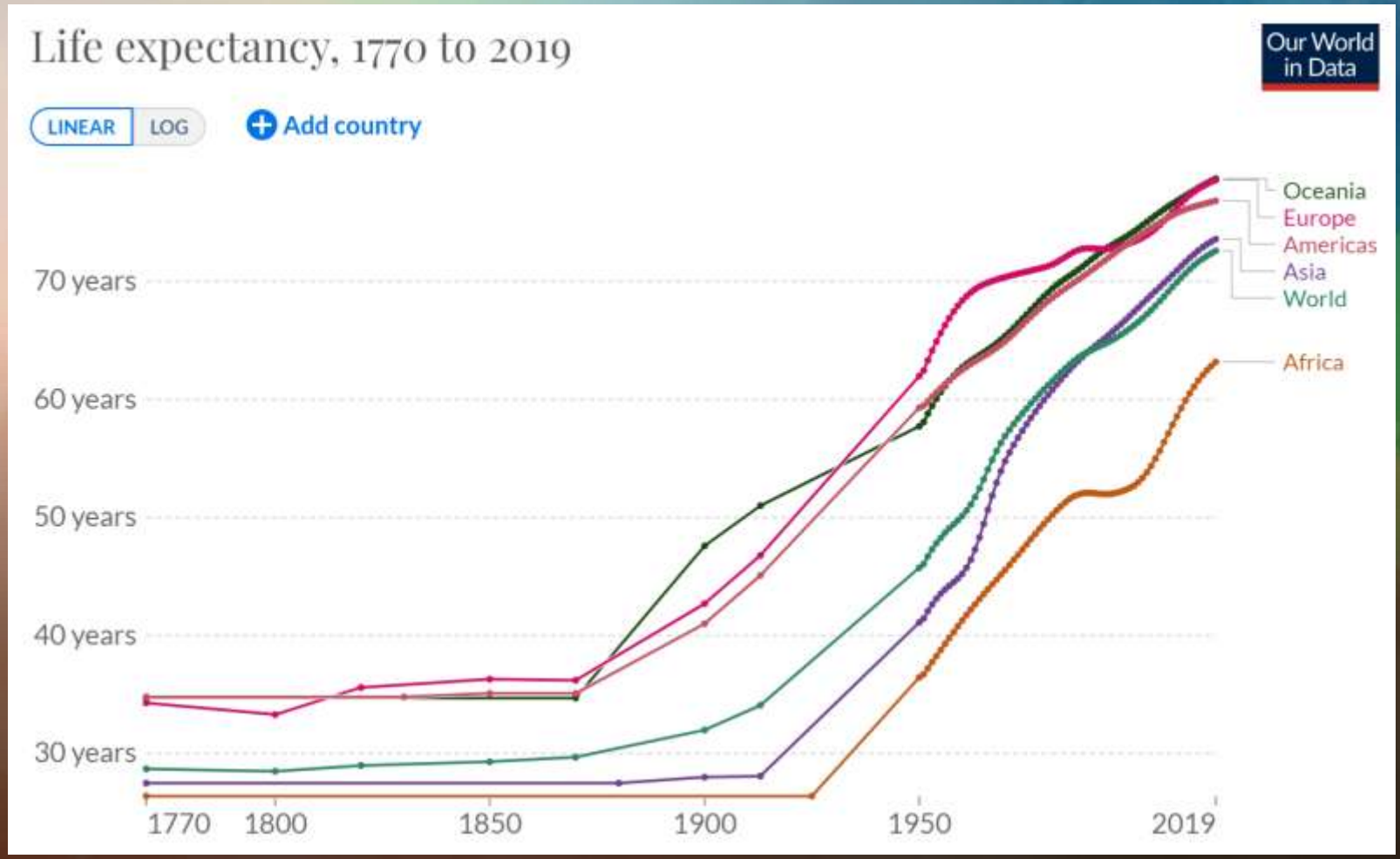
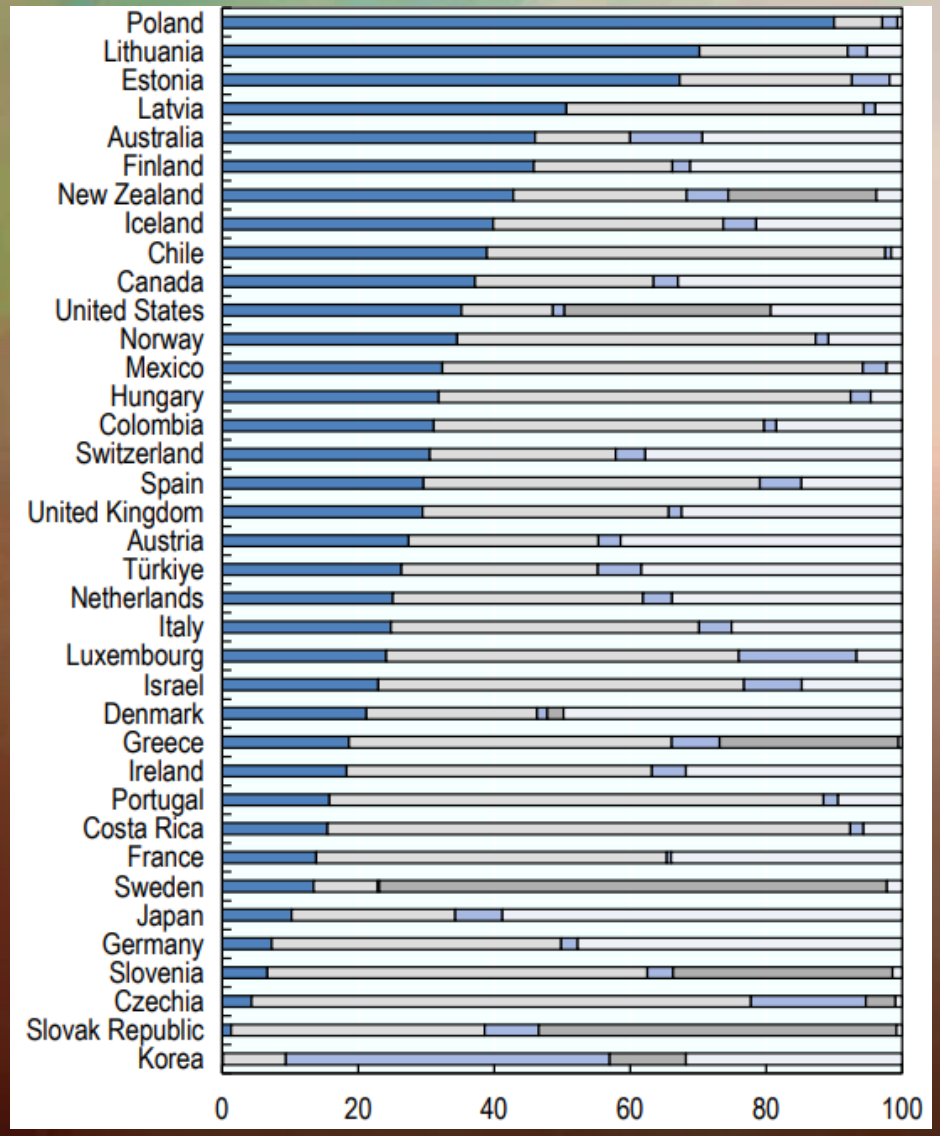
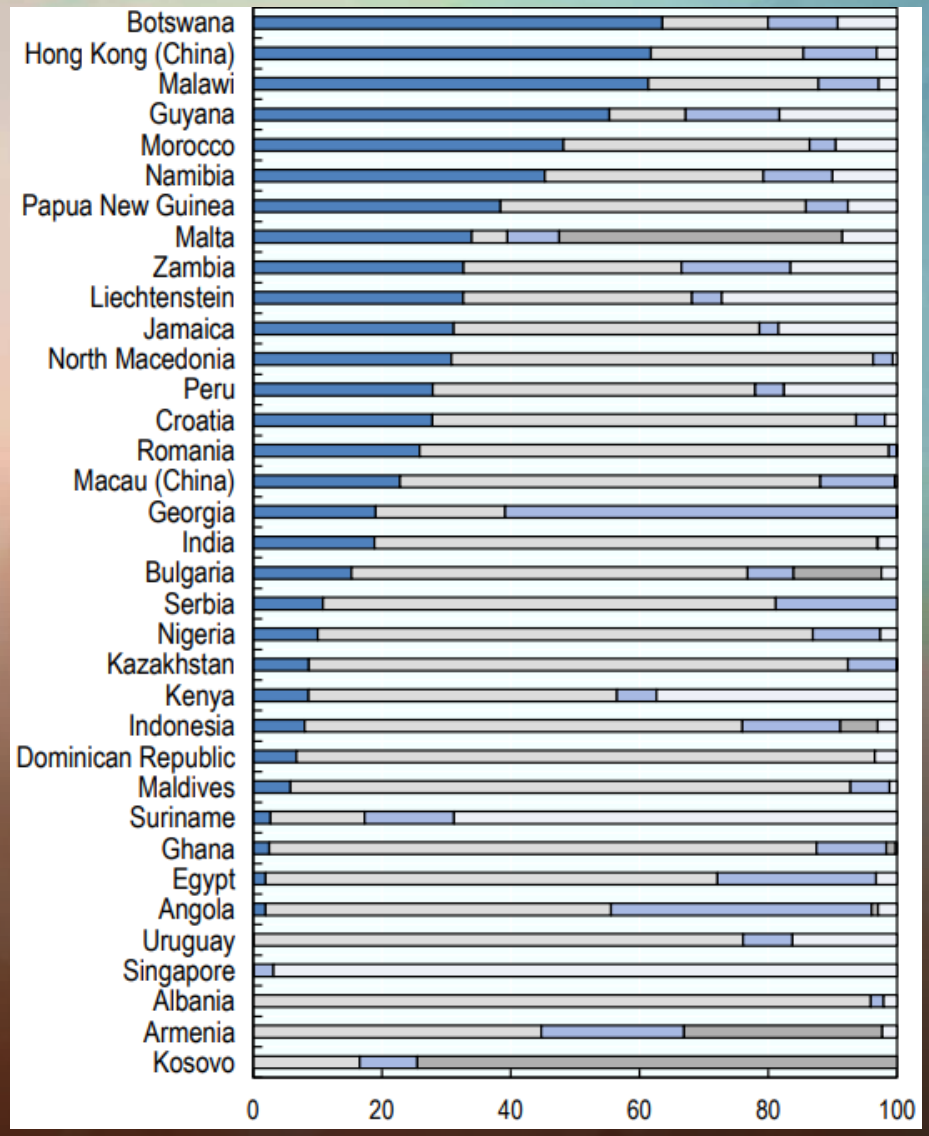


Figure 1.6. Average pensionable age in OECD countries by sex, 1950-2050
Men
Women
Pensionable age (years)
65
64
63
62
61
60
1950
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
Source: National officials, OECD calculations and Turner (2007).
StatLink
http://dx.doi.org/10.1787/888932370246

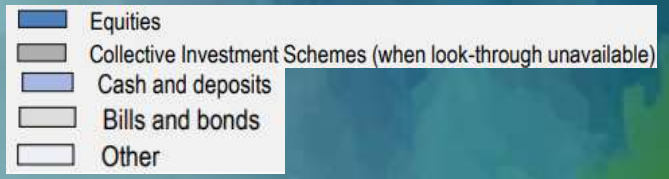

Life expectancy, 1770 to 2019
Our World in Data
LINEAR
LOG
Add country
Oceania
Europe
Americas
Asia
World
Africa
70 years
60 years
50 years
40 years
30 years
1770
1800
1850
1900
1950
2019

EXAMPLES

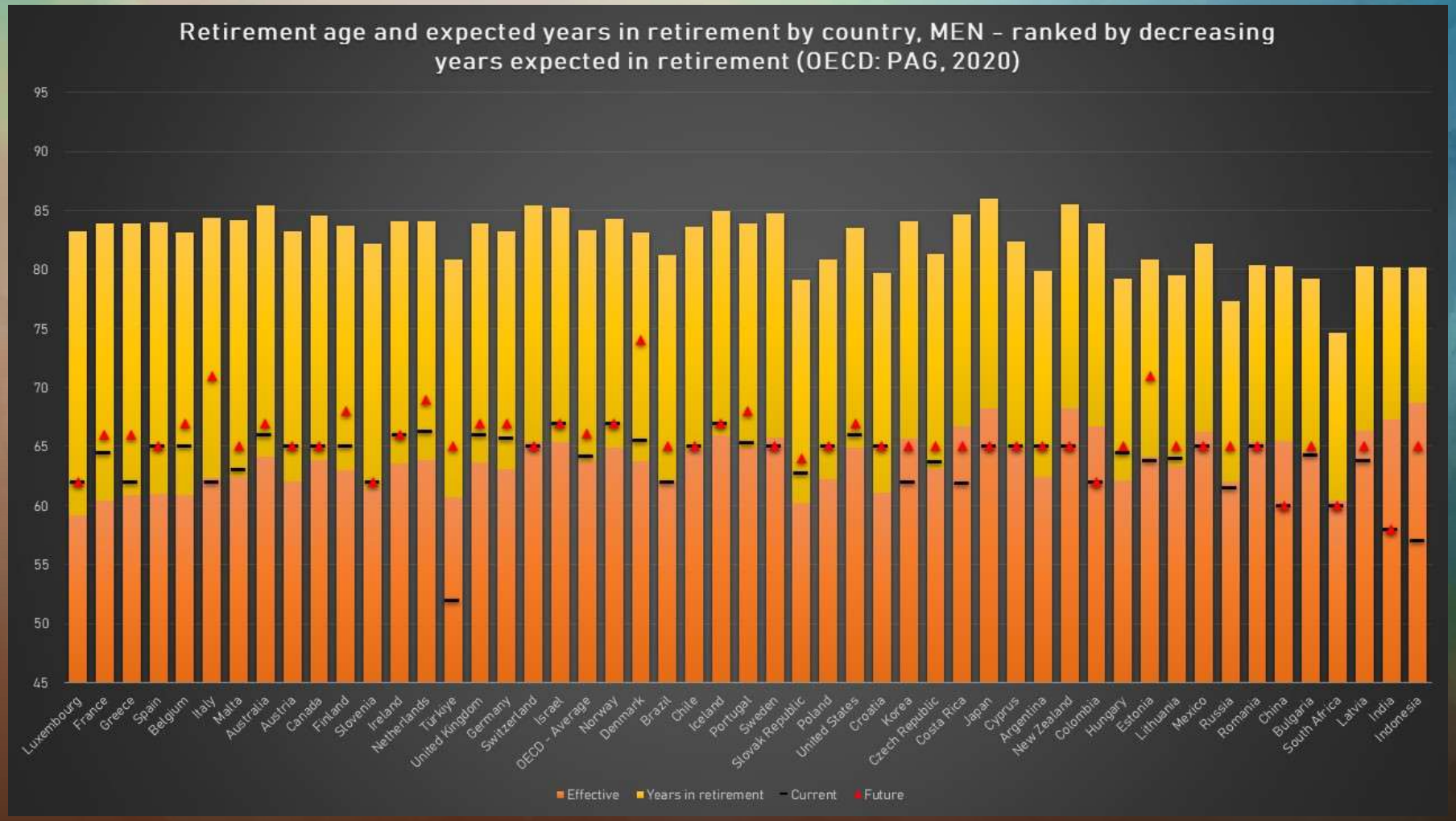




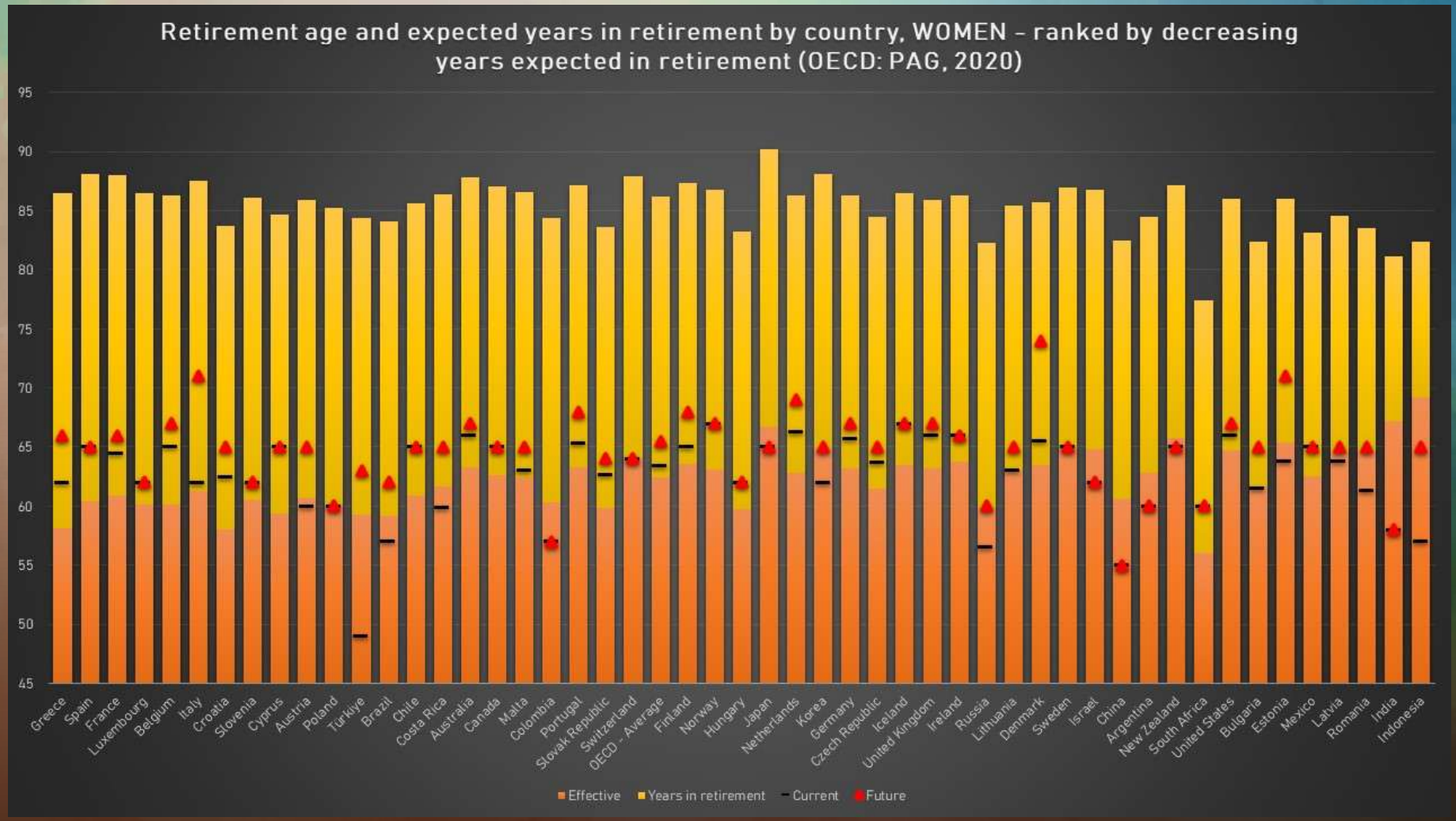
Globally, funded pensions are worth 63.1 trn USD in 2023 (OECD)



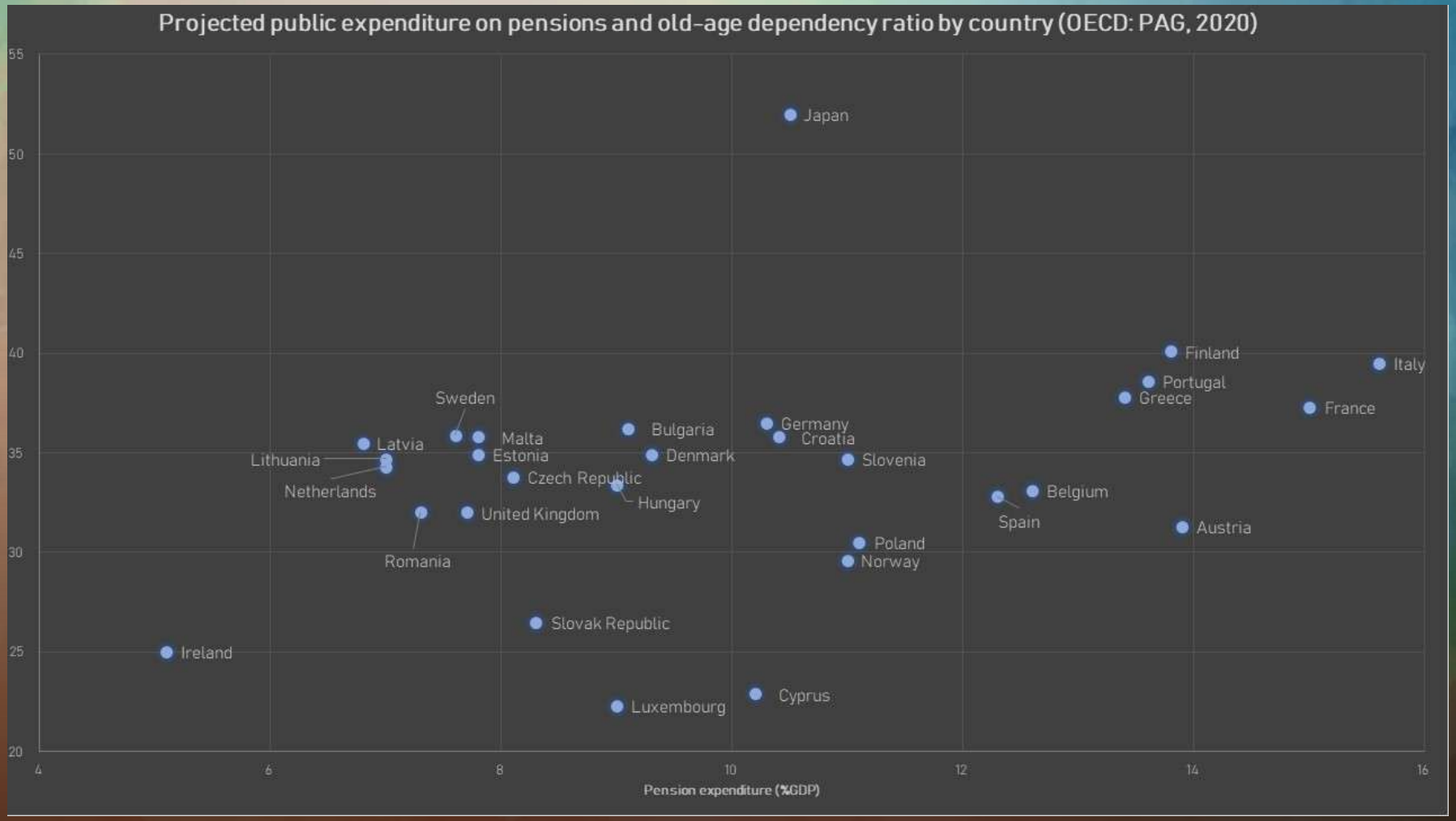
EXAMPLES


Retirement age and expected years in retirement by country, MEN - ranked by decreasing years expected in retirement (OECD: PAG, 2020)
95
90
85
80
75
70
65
60
55
50
45
Luxembourg
France
Greece
Spain
Belgium
Italy
Malta
Australia
Austria
Canada
Finland
Slovenia
Ireland
Netherlands
Türkiye
United Kingdom
Germany
Switzerland
Israel
OECD - Average
Norway
Denmark
Brazil
Chile
Iceland
Portugal
Sweden
Slovak Republic
Poland
United States
Croatia
Korea
Czech Republic
Costa Rica
Japan
Cyprus
Argentina
New Zealand
Colombia
Hungary
Estonia
Lithuania
Mexico
Russia
Romania
China
Bulgaria
South Africa
Latvia
India
Indonesia
Effective
Years in retirement
Current
Future

EXAMPLES


Retirement age and expected years in retirement by country, WOMEN – ranked by decreasing years expected in retirement (OECD: PAG, 2020)
95
90
85
80
75
70
65
60
55
50
45
Greece
Spain
France
Luxembourg
Belgium
Italy
Croatia
Slovenia
Cyprus
Austria
Poland
Türkiye
Brazil
Chile
Costa Rica
Australia
Canada
Malta
Colombia
Portugal
Slovak Republic
Switzerland
OECD - Average
Finland
Norway
Hungary
Japan
Netherlands
Korea
Germany
Czech Republic
Iceland
United Kingdom
Ireland
Russia
Lithuania
Denmark
Sweden
Israel
China
Argentina
New Zealand
South Africa
United States
Bulgaria
Estonia
Mexico
Latvia
Romania
India
Indonesia
Effective
Years in retirement
Current
Future

EXAMPLES


Projected public expenditure on pensions and old-age dependency ratio by country (OECD: PAG, 2020)
55
50
45
40
35
30
25
20
4
6
8
10
12
14
16
Pension expenditure (%GDP)
Japan
Finland
Italy
Portugal
Greece
France
Sweden
Germany
Bulgaria
Croatia
Malta
Latvia
Lithuania
Estonia
Denmark
Slovenia
Czech Republic
Netherlands
Hungary
Belgium
Spain
United Kingdom
Austria
Poland
Romania
Norway
Slovak Republic
Ireland
Cyprus
Luxembourg

EXAMPLES