EAPSPI 2023 Conference, 24 November 2023

The Challenge of an Adequate, Fair and a Sustainable Pension System

Pension System Design.

Annuities versus Lump-sums: When and Where

by

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1. Pension Design
2. Challenges of State Pensions
3. Pension Systems Reforms: example of the UK Pension System (comparison to the Spanish System)
4. Annuities versus Lump-sums
5. Concluding comments

1. Pension Design: Terminology

Basic techniques in order to finance pension liabilities

Pay-as-you-go	Funding
Pensions for retirees are paid by active people	Active people finance their own pension
Unfunded schemes	***Funded schemes***

1. Pension Design: Terminology

Every pension plan must have rules for the calculation of benefits and the contributions.

Defined benefit

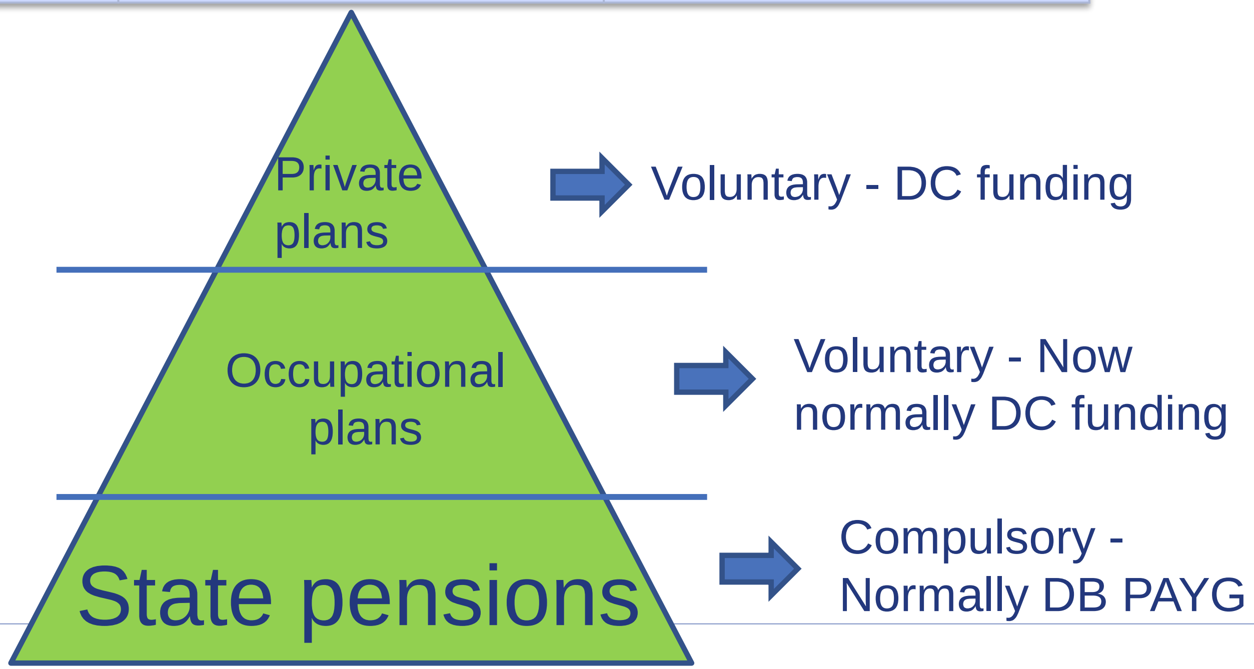
Benefit is calculated according to a fixed formula which usually depends on the member’s salary and the number of contribution years.

Defined contribution

Benefit is dependent on the amount of money contributed and their return.

1. Pension Design

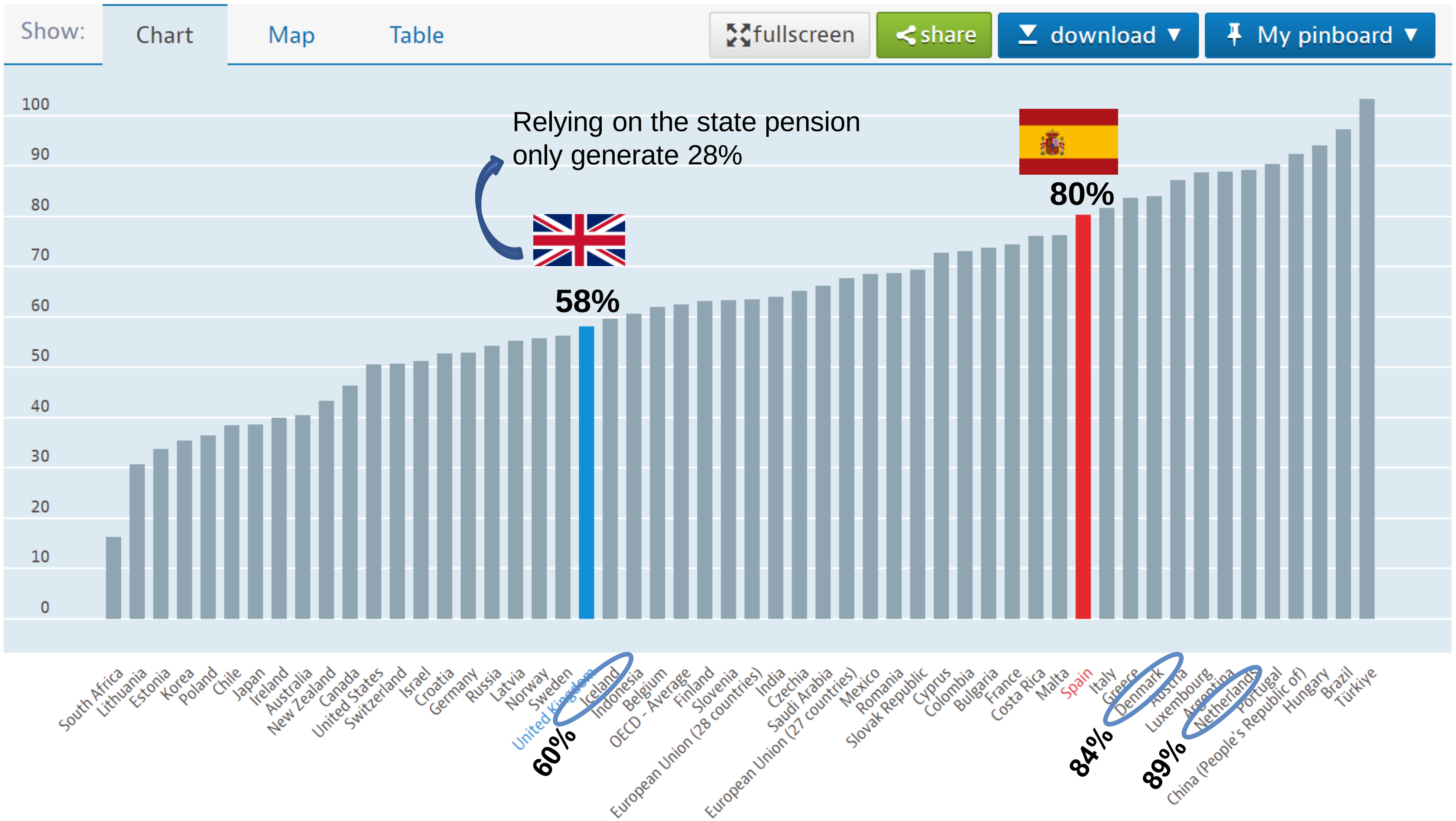
	Pay-as-you-go (PAYG)	Funding
DB	(normally) state pensions	Classical employee plan
DC	Notional accounts (NDCs)	Employee plan/ saving accounts



1. Pension Design

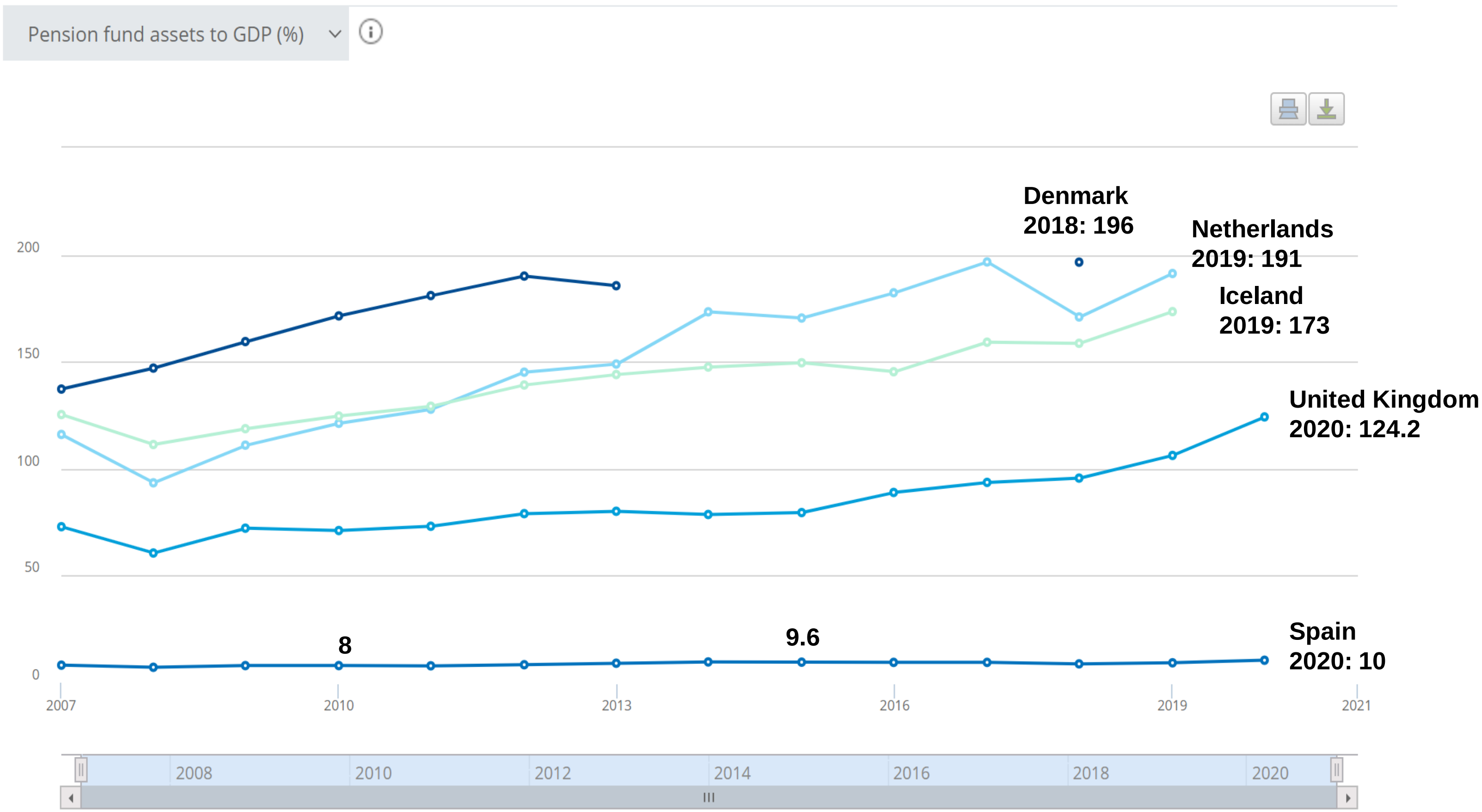
Net pension replacement rates Men, % of pre-retirement earnings, 2020 or latest available

Source: Pensions at a Glance



1. Pension Design

Pension fund assets to GDP (%)



Source: Global Financial Development

2. Challenges of State Pensions

Public pension systems are usually financed on a pay-as-you-go (PAYG) basis. Here, pensions for retirees are paid by the contributions of the working-age population.

Contributions by working-age population

Pensions for retirees

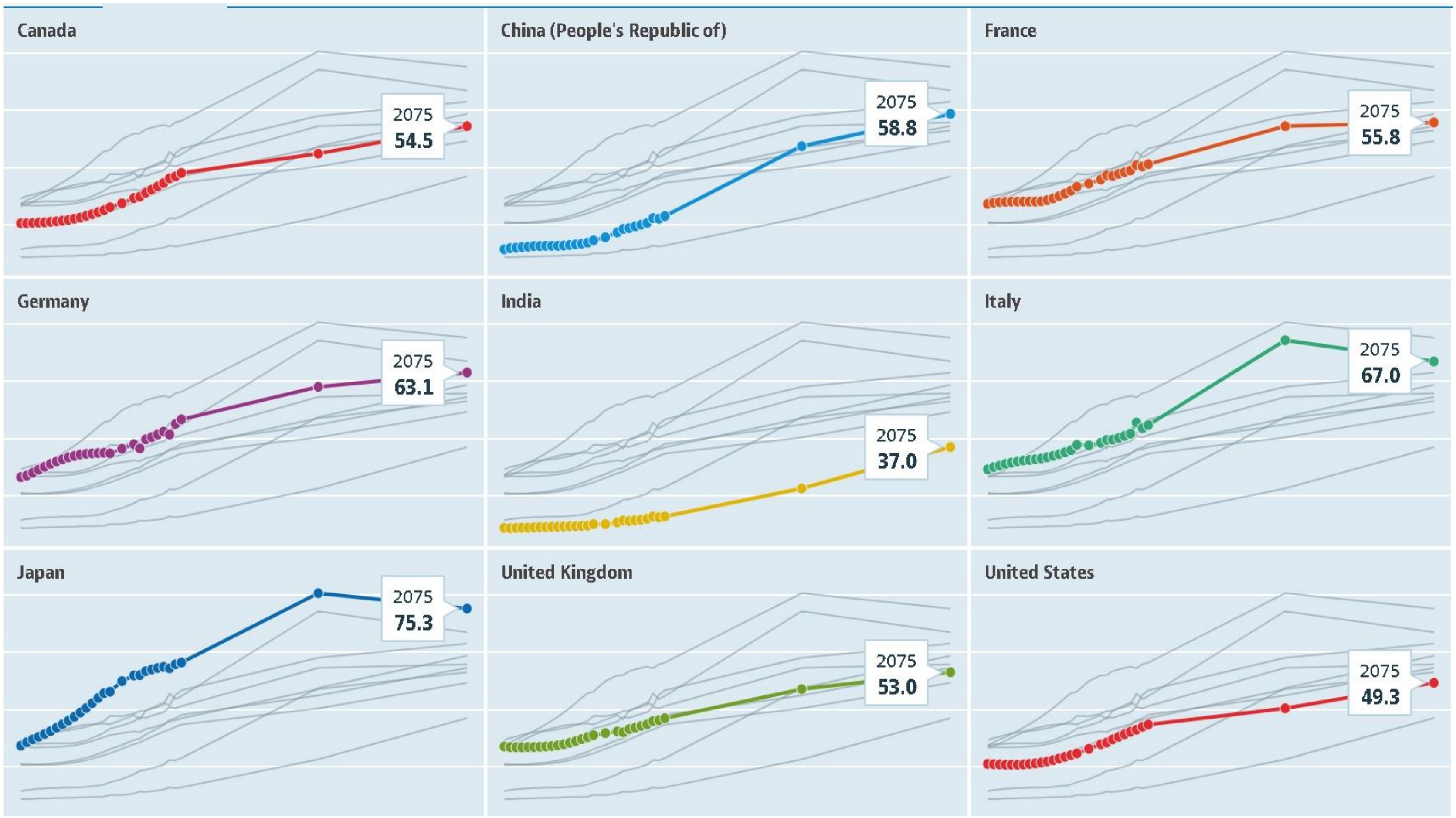
The success of this pension scheme depends on a balance existing between the pension expenditure and income from contributions.

2. Challenges of State Pensions

- In 2060, there will be fewer than two working-age people per retiree compared to more than three currently while life expectancy at retirement age increases from 21 to 25 in 2060.
- The current forecasts for the ageing of the baby-boom generations will contribute to an increase in the old-age dependency ratio.
- This raises serious concerns about the sustainability of pay-as-you-go pension systems.

2. Challenges of State Pensions

Old age dependency ratio: number of individuals aged 65 and over per 100 people of working age defined as those at ages 20 to 64. (OECD 2022)



2. Challenges of State Pensions

- The common trend resulting from these events, that negatively affect the financial health of the systems, is a wave of parametric adjustments including countries, among others, France, Greece, Hungary, Romania and Spain.
- Among the major changes in pension reform is the introduction of what is known as Notional Defined Contribution schemes (NDCs), first developed about twenty years ago in countries such as Italy, Latvia, Poland and Sweden.
- In **Latin America**, since the 1980s, most of the countries replaced completely or partially their PAYG schemes with programs containing a funded component.
- Countries, such as Australia, Canada, Norway, Sweden, Latvia and Poland, combine funded and PAYG elements within a compulsory basic pension.

2. Challenges of State Pensions

- Some countries have decided to set up Automatic Balancing Mechanisms (ABMs).
- ABMs are defined as a set of predetermined measures established by law to be applied immediately as required according to an indicator that reflects the financial health of the system.
- Their purpose, through successive application, is to re-establish the financial equilibrium of PAYG schemes without the repeated intervention of the legislator.

3. Pension System Reforms: Spain

- Public pensions (earning-related and based on PAYG) are the most important source of income for people aged 65 and over.
- Non-contributory pensions have a much more limited coverage.
- Occupational pension schemes have very limited coverage. (EPSV in the Basque Country, reform Spanish occupational pension plans)

Proportion of people over a certain age

Years	65 and over years (%)	70 and over years (%)	80 and over years (%)	100 and over years (%)
2017	19.0	13.9	6.1	0.02
2018	19.2	14.0	6.2	0.02
2019	19.4	14.3	6.1	0.02
2020	19.6	14.4	6.0	0.03
2021	19.8	14.5	6.1	0.03
2025	21.0	15.1	6.3	0.04
2030	22.8	16.4	6.9	0.07
2035	25.1	18.3	7.5	0.09
2040	27.4	20.3	8.6	0.10
2045	29.6	22.3	9.8	0.14
2050	30.4	24.0	11.0	0.18
2055	30.3	24.5	12.1	0.22
2060	29.9	24.1	13.0	0.28
2065	29.4	23.5	12.9	0.35
2072	29.5	22.8	12.0	0.43

Source 2017-2021, Basic Demographic Indicators. (2021 provisional)

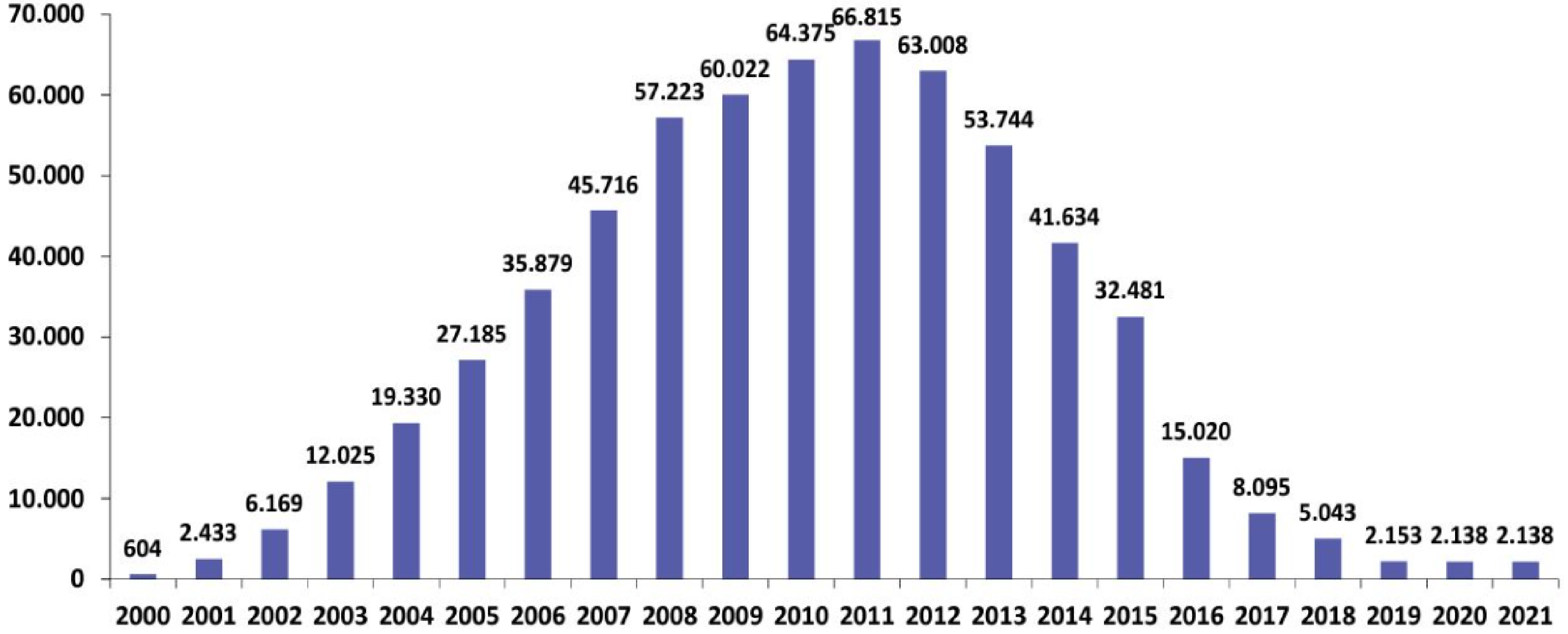
Projected dependency rates

Year	Over 64 years old (%)	Under 16 years old (%)	Total (under 16 and over 64 years old) (%)
2017	29.2	24.7	53.8
2018	29.6	24.6	54.2
2019	29.9	24.4	54.3
2020	30.2	24.0	54.2
2021	30.5	23.6	54.0
2026	32.9	21.4	54.3
2031	36.4	20.1	56.5
2036	41.2	20.1	61.2
2041	47.0	21.4	68.5
2046	52.2	22.8	75.0
2051	53.8	23.0	76.8
2056	53.0	22.3	75.3
2061	51.4	21.4	72.9
2066	50.2	20.9	71.2
2072	50.8	21.4	72.2

Source 2017-2021, Basic Demographic Indicators. (2021 provisional)

3. Pension System Reforms: Spain

Reserve Fund



3. Pension System Reforms: Spain

Pension reform

Law 27/2011:

- The statutory **retirement age** increased from **65** to **67** (gradually applied over 2013-2027). Some exceptions might apply.
- **Reference period** for calculating the pension was extended from **15** to **25** years over the period 2013-2022.
- Correlation between years of contribution and initial pension amount changed. In 2027, the **contribution period** required to get 100% of pension will be **37** years (before it was 35)

3. Pension System Reforms: Spain

Pension reform

Amendment in 2013

- Initial pension amount will be affected by a **sustainability factor - based on life expectancy –** that adjust the initial amount. Estimated impact: reduction of initial pension by 5% every 10 years. **<u>Scheduled to come into effect in 2019 but delayed until 2023, and cancelled.</u>**

- **New annual revaluation**. It used to be linked to inflation but the new indexation takes into account a number of factors such as social security **revenue** and **expenditure**. Law guarantees that the index will never be lower than 0.25 or higher than the consumer price index plus 0.50. (replaced by the Intergenerational Equity Mechanism).

- Changes in 2011 and 2013 on the legal requirements for **partial early retirement** over period 2013-2017. **Full early retirement** subject to **stricter** conditions.

3. Pension System Reforms: Spain

Pension reform 2023

- **Reference period from 25 to 29 (without considering the worst 2 years).**
- **Increase of minimum and maximum pensions.**
- **Intergenerational Equity Mechanism (increase of 0.6% of contribution rate).**
- **Increase of the maximum contribution base.**
- **Solidarity additional contribution.**

Increase of 0.4% + 0.4% + 0.2% of PIB

Mercer CFA Institute Global Pension index 2023 (10 out of 44)

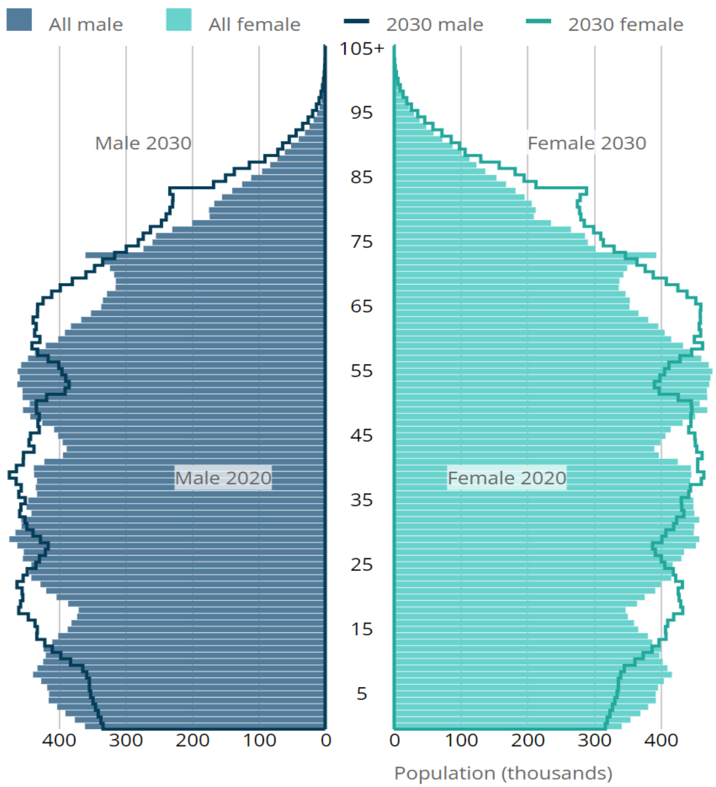
	Overall	Adequacy	Sustainability	Integrity
Spain	61.6 54.4 in 2018	79.7	28.5	79.2

Value could increase if

- Increasing coverage of employees in occupational pension schemes.
- Increasing the labour force participation at older ages.

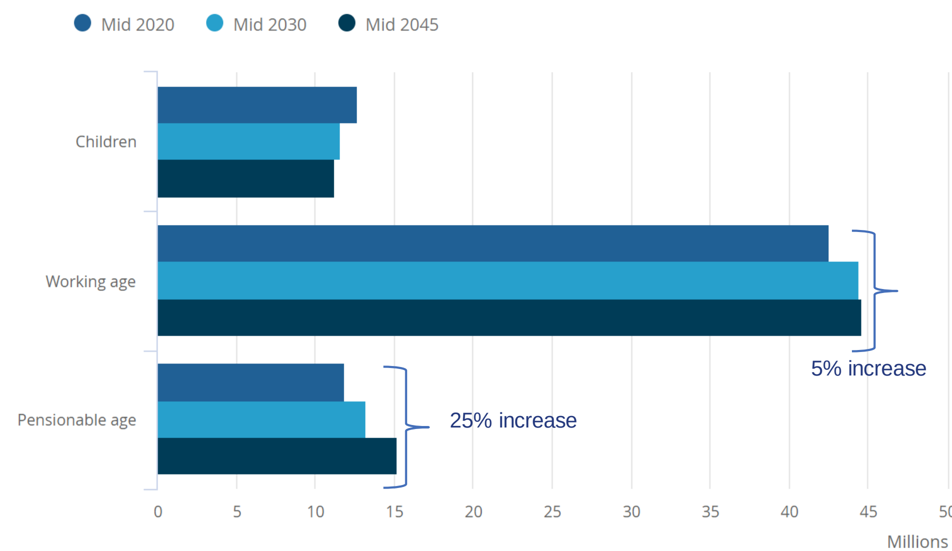
3. Pension System Reforms: The UK

Age structure of the UK population, mid-2020 and mid-2030



Source: Office for National Statistics

UK population by life stage, mid-2020, mid-2030 and mid-2045



Source: Office for National Statistics

- There are projected to be many more people at older ages by 2045, in part because of the baby boomers from the 60s (now being aged around 80) as well as general increases in life expectancy.
- Assumed fertility rates in the 2020s and 2030s lower tan those around 2001.
- The old-age-dependency ratio (n. people of pensionable age/ working age) increases from 28% in mid-2020 to 34% by mid-2045

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Characteristics of the British old-age pension system before the reforms

- The UK state pension system traditionally consisted of a state basic pension and an earnings-related element.
- In addition, there are a range of voluntary workplace and voluntary personal pension components, which are important in terms of complementing the state scheme.
- Many medium and large-sized companies have their own pension plans

3. Pension System Reforms: The UK

In 2006, the **Pension Protection Fund** was established for members of DB pension schemes in case the employer became insolvent.

In 2010, the **Triple lock** for the state pension is introduced. State pensions rises in line with the highest of these three measures every year.

- A flat 2.5% rise
- Average earning growth
- Inflation

3. Pension System Reforms: The UK

In 2011, the **Default Retirement Age** (DRA) was removed – employers could no longer require employees to retire at 65

In 2012, **auto-enrolment** (provided by the Pension Act 2008) was introduced in large companies.

The employer enrols all eligible employees in a workplace pension scheme, to which the employer must make a minimum contribution. The employees have the option of opting out of the scheme.

Aim: ensure that all employees are offered the opportunity of a workplace pension scheme

Problem: concerns about the low levels of contribution rates to these schemes.

3. Pension System Reforms: The UK

Under the **Pensions Act 2014**

- The **state pension system** has been replaced by a **fixed rate** for all new pensioners. This new fixed rate requires 35 years of contributions and those working beyond the state pension age can increase their pension.
- **Increase** in the **retirement age** and equalise the retirement age between men and women.
- Minimum standards concerning **governance** and administration of workplace pension schemes.

Pension Freedom: From April 2015, those with a DC scheme can **withdraw** the pension **pot** from the age of **55**.
Aim: make pensions more flexible
Problem: Individuals can spend all their cash, leaving little for actual retirement.

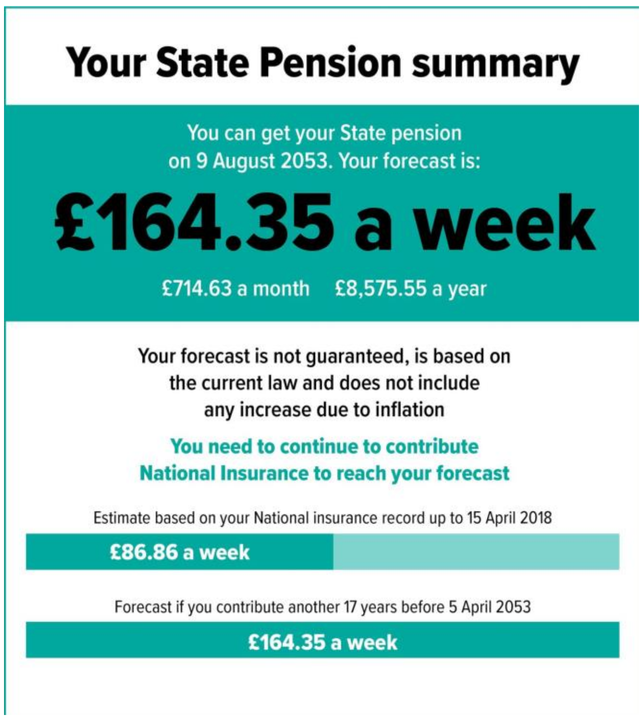
Note: Many company **DB schemes** have **closed** to **new entrants**, most workers are now covered by DC schemes.

3. Pension System Reforms: The UK

The full new State Pension is £203.85 per week. For a full State Pension 35 qualifying years are necessary

The only reasons you can get more than the full State Pension are if:

- you have over a certain amount of Additional State Pension
- You defer (delay) taking your State Pension



Forecasts of the State Pension can be found at gov.uk

State pensions: Government Actuary's Quinquenial Review of the NI Fund as at April 2020

Chart 2.2 – Projected Fund income and expenditure 2020-2021 to 2085-2086 (in real earnings terms)

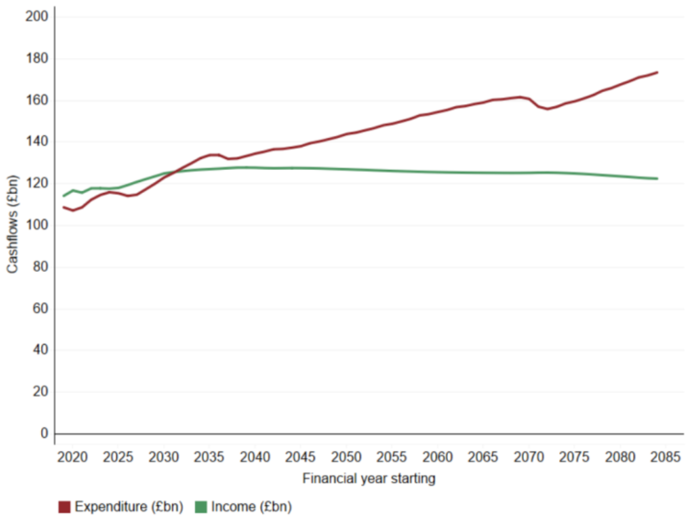


Chart 2.3 – Projected population of Great Britain and dependency ratio

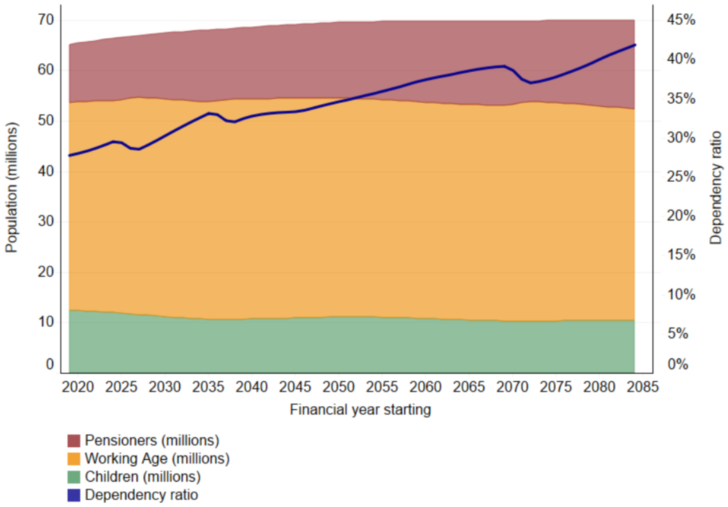
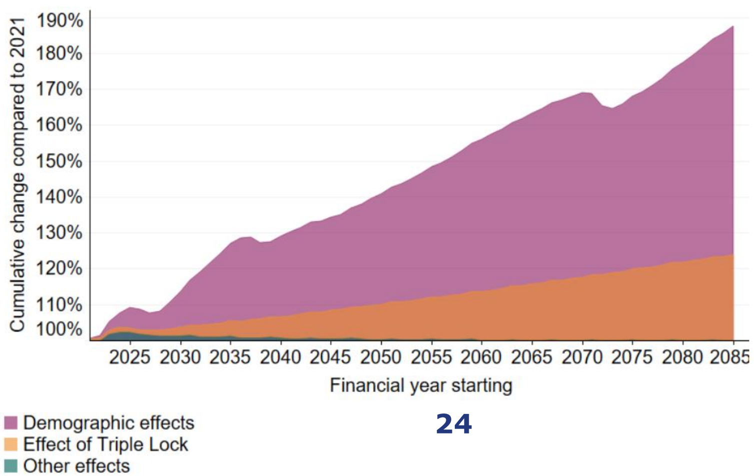


Chart 2.4: Factors driving increases in total benefit expenditure (in real earnings terms)



3. Pension System Reforms: The UK

State pensions: Government Actuary's Quinquenial Review of the NI Fund as at April 2020

Chart 3.2 – Projected breakeven contribution rates 2020-2021 to 2085-2086 – principal assumptions & 2018-based population assumptions

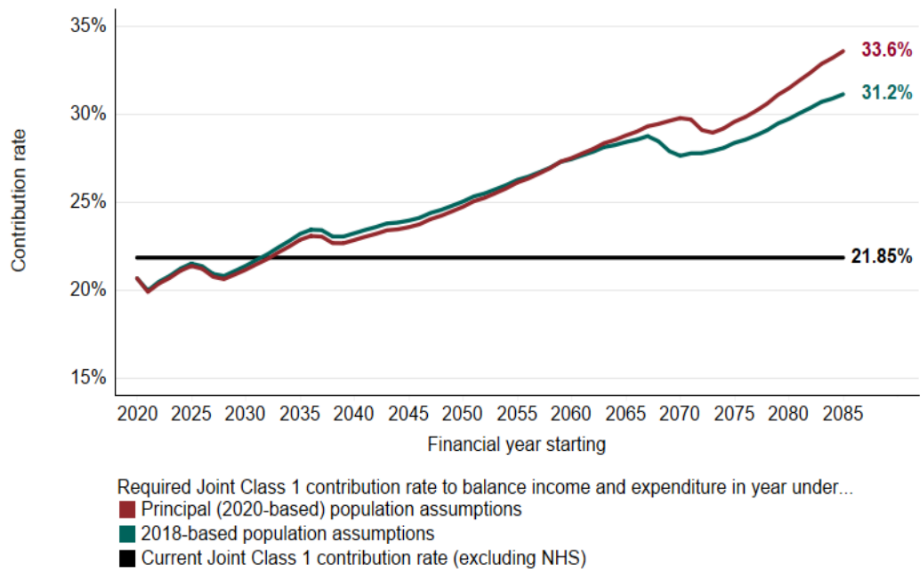
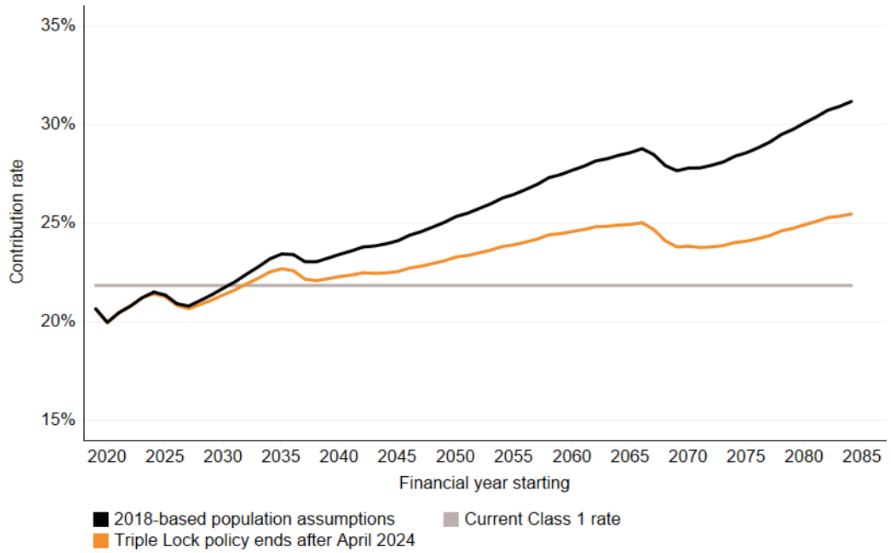


Chart 3.5 – Variant Triple Lock scenario – Projected breakeven contribution rate



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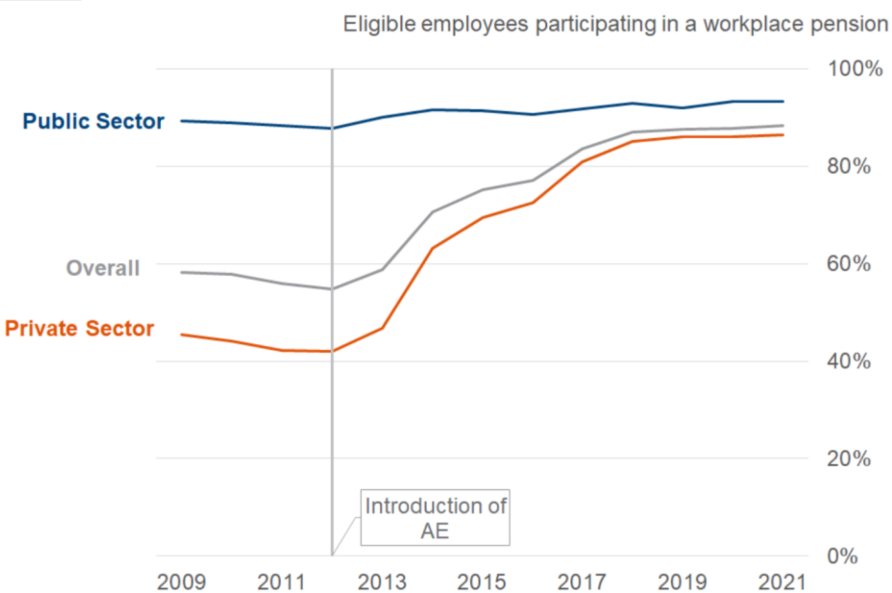
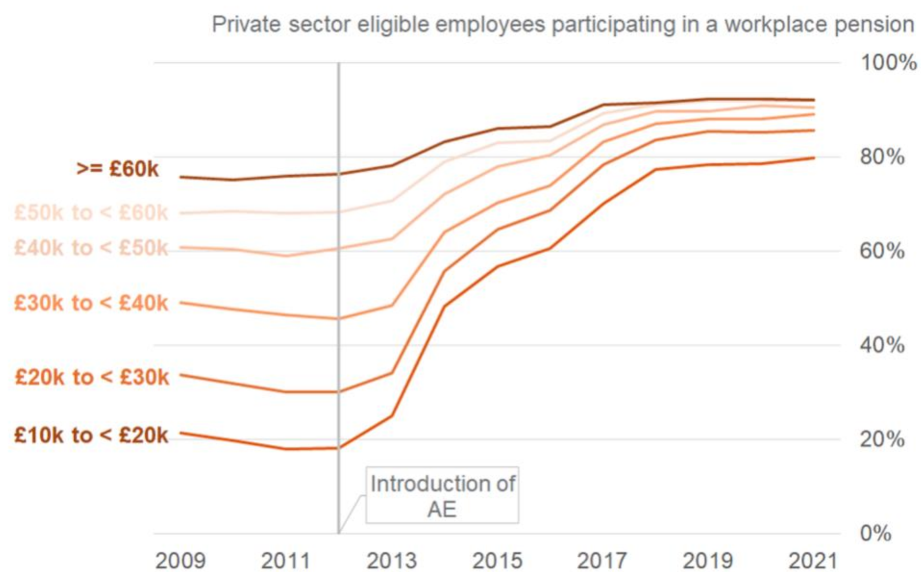
Occupational (work-based) pension plans - Autoenrolment

- All employers must provide a workplace pension scheme.
- Your employer must automatically enrol you into a pension scheme and make contributions to your pension.
- This is called '**automatic enrolment**'.
- There is a minimum total amount that has to be contributed by you, your employer, and the government (in the form of tax relief). Min 5% from you (includes tax relief) and 3% from your employer
- You can opt out of your employer's workplace pension scheme after you've been enrolled – but you will lose out your employer's contributions.

Participation in the workplace pension

The proportion of private sector eligible employees participating in a workplace pension has increased sharply since 2012; public sector participation remains high



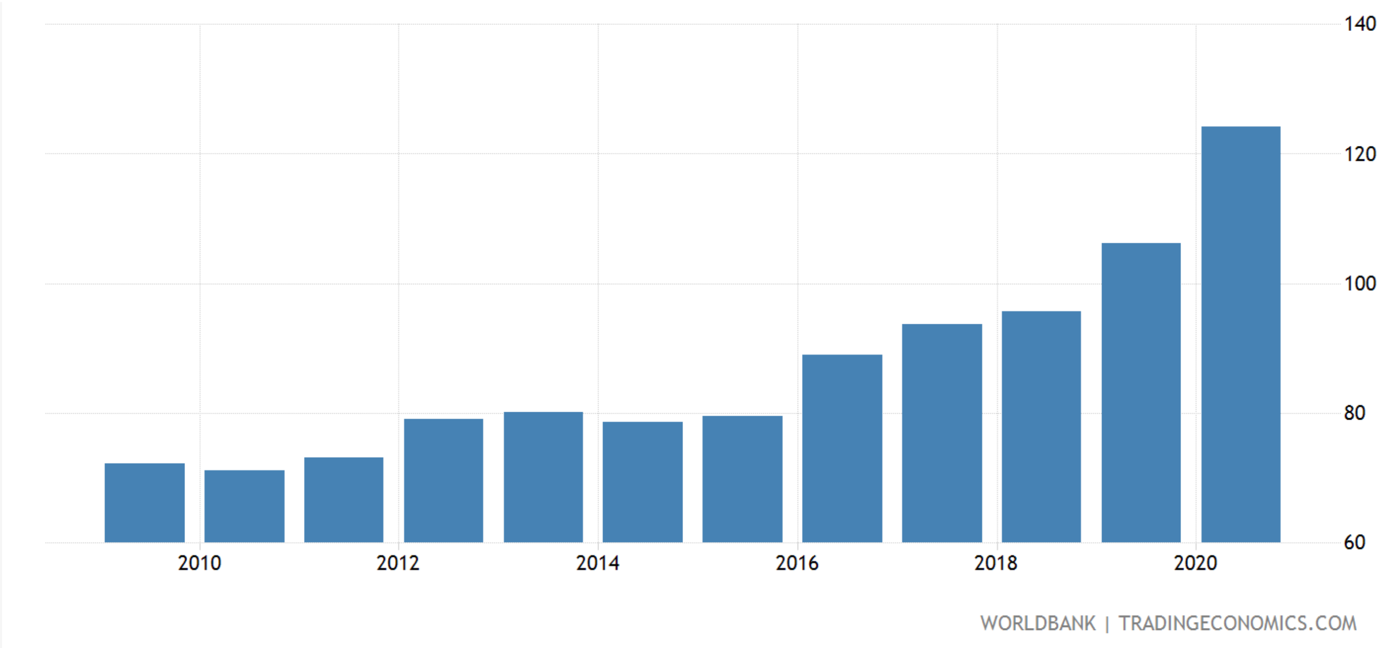


Source: DWP estimates derived from the ONS ASHE, GB, 2009 to 2021

Source: www.gov.ac.uk

3. Pension System Reforms: The UK

Participation in the workplace pension



Ratio of assets of pension funds to GDP. A pension fund is any plan, fund, or scheme that provides retirement income. Data taken from a variety of sources such as OECD, AIOS, FIAP and national sources.

3. Pension System Reforms: The UK

How do the UK compare with other countries?

- Mercer CFA Institute Global Pension index 2023 (10 out of 44)

	Overall	Adequacy	Sustainability	Integrity
UK	73.7	77.3 57.8 (in 2018)	62.7	80.6

Value could increase if

- Restoring the retirement to take retirement savings as an income stream
- Raising minimum pension for low-income pensioners
- Increasing contribution levels required under auto-enrolment.

4. Annuities versus Lump-sums (Pensions Freedom)

	Pay-as-you-go	Funding
DB	(normally) state pensions	Classical employee plan
DC	Notional accounts (NDCs)	Employee plan/ saving accounts

- **Public systems**: trend from traditional pure pay-as-you-go schemes (affected by demographic risks) to mixed schemes with an increased weight on occupational pension plans.
- A careful design is needed so that the degree of uncertainty (investment risks) with respect to the pension amount is minimised.
- According to Global Pension Index: The index can increase if retirement savings as an income stream.

4. Annuities versus Lump-sums

Life annuities are means of insuring against the risk of "living too long".

Age 65

200,000

i=5%

Year 1: 30,000
Capital: 180,000

Year 2: 30,000
Capital: 159,000

Year 3: 30,000
Capital:136,950

…

Year 8: 30,000
Capital: 9017,82

A life annuity is a contract between an insurer/pension provider and the annuitant which provides the following:

In return for the payment by the annuitant of prescribed premiums/capital, the insurer will provide a sequence of payments, known as annuity benefits, of prescribed amounts and at prescribed times.

The unique requirement to receive the benefits is that the individual is alive. (redistribution between lives)

4. Annuities versus Lump-sums. Experience from the UK

- Pension freedoms in the UK were announced in 2014 and introduced in 2015.
- It allows savers to access their DC pension from the age of 55 (57 after 2028) and use the funds for a wider range of options: cash withdrawal (25% tax-free lump sum), income products, etc

- According to a research project carried out for the Financial Conduct Authority, there are 5 questions for consumers to answer if they do not buy a life annuity and suggest the skills needed to answer them

1. How long will I live? 
2. How much money do I want to take out of my pot as an income? **Actuary**
3. What investment return will the pot need to generate to make sure I don't run out of money? **Investment manager**
4. How can I limit my tax liability? **Tax accountant**
5. What is the long term inflation risk? **Economist**

4. Annuities versus Lump-sums

24 March 2017 last updated

Pension freedoms tax receipts exceed HMRC expectations at £1.5bn

Pensions freedoms has raised significantly more tax for the HMRC than the government had expected with £1.5bn in the 2015/16 tax year compared to the original estimate of only £300m.

According to figures published in the Spring Budget the government had initially estimated raising £300 million from the pension freedoms in 2015/16 and £600 million in 2016/17.

Due to the large number of people cashing-in their pensions the actual tax received is £1.5 billion in 2015/16 and £1,1 billion in the tax year 2016/17.

In the 2014 Budget the then Chancellor George Osborne introduced pension freedoms to allow people retiring to avoid buying a pension annuity and take their tax free lump sum with the remaining fund withdrawn from the pension and taxed at their marginal rate.

People also have the freedom to invest in flexi-access drawdown or a fixed term plan where their can access their pension either as an income, lump sum or both.

Government tax receipts from pension freedoms is £1.5bn five times greater than expected

More annuity topics

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- News & articles
- Archive news stories
- Flexi-access drawdown
- Annuity rates tables
- Outlook for 2022
- Annuity rates charts
- 15-year gilt yields
- Latest annuity rates

4. Annuities versus Lump-sums

Advantages

- More options: Flexibility for the individual
- Inheritance gains

Disadvantages

- Concern about the capabilitities of individuals: It requires lot of planification and financial education of the individual.
- At retirement people need security and this flexibility is providing individuals with bank accounts.
- Transfer of risks: Pension provider transfer longevity risks to individuals.
- If this freedom does not exist with state benefits, why for occupational pension plan when in the UK it represents 2/3 of the retirement income?
- Definition of pension destroyed: **a regular payment made for life** by the state to people of or above the official retirement age.
- Poverty? In a decade we will know…. (trade-off between autoenrolment and pensions freedom).

5. Conclusions

- Financial sustainability of PAYG pension schemes are compromised due to demographic risks.
- Popularity of mixed pension systems and occupational pension plans are increasing.
- Countries, such as Australia, Canada, Norway, Sweden, Latvia combine funded and PAYG elements within a compulsory basic pension.
- For DC pension plan, state will need to offer security to the individuals at retirement (annuities) and reduce the investment risk in the accumulation phase.

Bibliography

- Boado-Penas, M.C., Godínez-Olivares, H. and Haberman, S. (2020) "Automatic balancing mechanism for pay-as-you-go pension finance: Do they actually work?" In Peris-Ortiz, M., Alvarez-Garcia, J., Dominguez-Fabian, I. and Devolder, P. eds. Economic Challenges of Pension Systems - A Sustainability and International Management Perspective. ISBN 978-3-030-37912-4.

- Ignition House, 2021, New Choices, Big Decisions. 5 Years On, Ignition House January 2021.

- Government Actuary's Quinquenial Review of the NI Fund as at April 2020.

- Mercer CFA Institute Global Pension Index 2022.

- Pensions at a Glance 2021. *OECD and G20 Indicators*

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Thank you for your attention – Eskerrik asko zure arretagatik

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