

SOA Longevity Webcast Series: Implications of Longevity Risk

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The Broad Economic Impact





SOA Longevity Webcast



Richard Jackson
President
Global Aging Institute

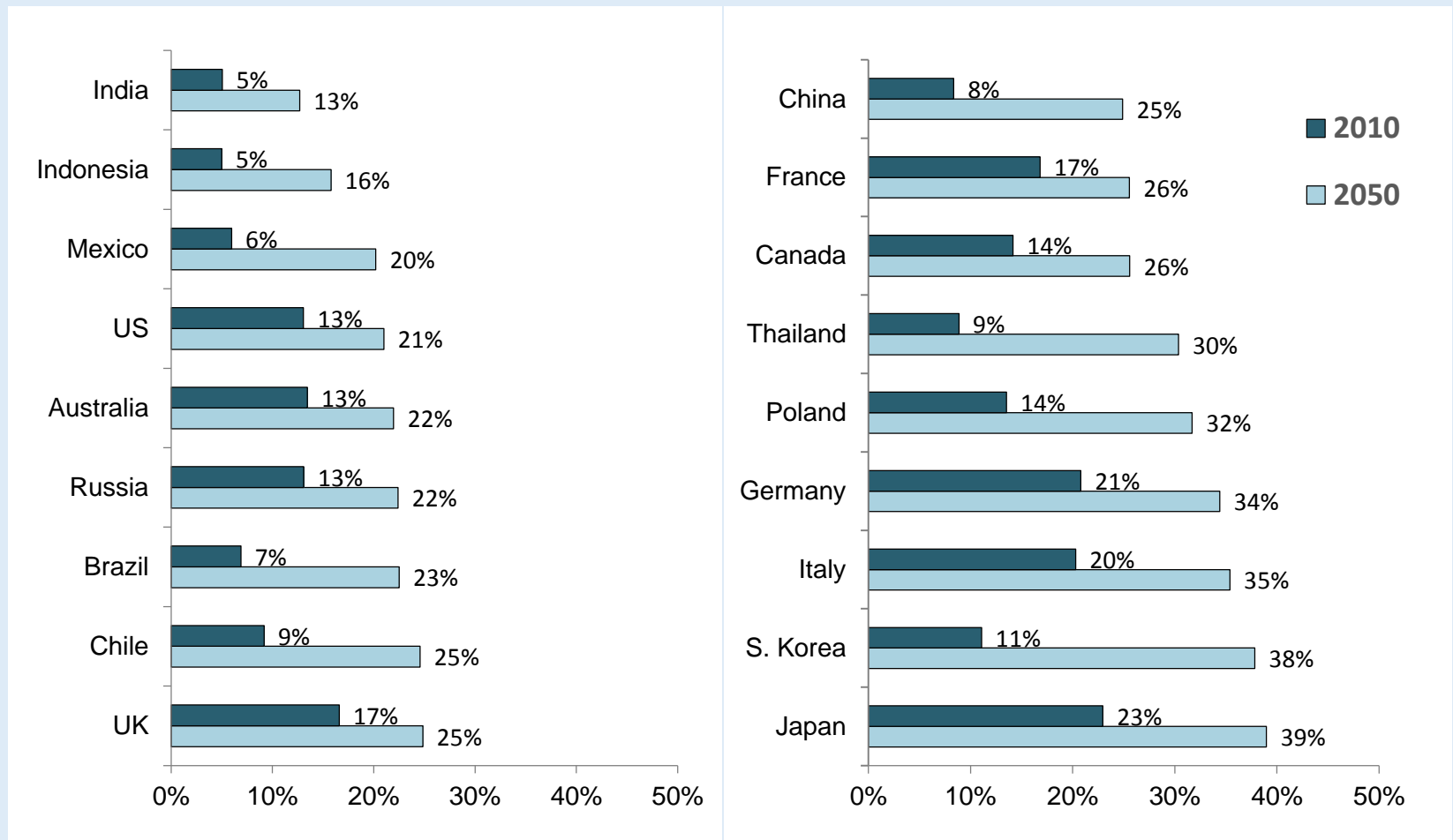


Society of Actuaries

February 3, 2016

The world stands on the threshold of a stunning demographic transformation called global aging.

Elderly (Aged 65 & Over), as a Percent of the Population in 2010 and 2050



Source: *World Population Prospects: The 2012 Revision* (UN Population Division, 2013)

Behind Global Aging: Falling Fertility

Total Fertility Rate

	Developed Countries				Emerging Markets		
	1960-65	1980-85	2005-10		1960-65	1980-85	2005-10
Australia	3.3	1.9	1.9	Brazil	6.2	3.8	1.9
Canada	3.7	1.6	1.6	China	5.6	2.6	1.6
France	2.9	1.9	2.0	India	5.8	4.5	2.7
Germany	2.5	1.5	1.4	Indonesia	5.6	4.1	2.5
Italy	2.5	1.5	1.4	Mexico	6.8	4.3	2.4
Japan	2.0	1.8	1.3	Russia	2.6	2.0	1.4
UK	2.8	1.8	1.9	S. Africa	6.3	4.6	2.6
US	3.3	1.8	2.1	S. Korea	5.6	2.2	1.2

Source: UN Population Division (2013)

Behind Global Aging: Rising Life Expectancy

Life Expectancy at Birth

Developed Countries				Emerging Markets			
	1950-55	1980-85	2005-10		1950-55	1980-85	2005-10
Australia	69.3	75.1	81.7	Brazil	50.9	63.4	72.4
Canada	69.0	75.8	80.5	China	44.6	67.7	74.4
France	67.3	74.8	80.9	India	37.9	56.2	64.9
Germany	67.5	73.8	79.8	Indonesia	38.8	58.8	69.6
Italy	66.3	74.8	81.5	Mexico	50.7	67.7	76.3
Japan	62.2	76.9	82.7	Russia	64.5	67.4	67.2
UK	69.3	74.1	79.6	S. Africa	45.0	58.4	52.2
US	68.6	74.3	78.1	S. Korea	47.9	67.4	80.0

Source: UN Population Division (2013)

The Developed Word: A Future of Rising Fiscal Burdens

Total Public Benefits to the Elderly (Aged 60 & Over) as a Percent of GDP in 2010 and 2040

	Public Pensions		Health Benefits		Other Benefits		Total Benefits	
	2010	2040	2010	2040	2010	2040	2010	2040
Australia	3.7%	4.7%	3.0%	5.5%	2.3%	3.1%	9.1%	13.4%
Canada	4.0%	5.4%	4.3%	9.0%	1.0%	1.4%	9.3%	15.8%
France	12.6%	13.6%	4.7%	9.0%	1.3%	1.7%	18.6%	24.3%
Germany	10.3%	12.4%	4.7%	8.9%	1.9%	3.0%	17.0%	24.3%
Italy	13.9%	15.0%	3.9%	7.9%	2.2%	2.7%	20.0%	25.7%
Japan	9.3%	10.5%	5.2%	9.8%	0.6%	0.6%	15.1%	20.9%
Netherlands	4.6%	8.6%	3.4%	8.3%	2.2%	2.9%	10.2%	19.8%
Sweden	7.5%	8.4%	5.2%	7.3%	2.6%	3.5%	15.2%	19.3%
UK	7.5%	7.9%	4.6%	8.7%	1.9%	2.3%	13.9%	18.9%
US	4.8%	6.4%	5.1%	11.0%	1.2%	1.1%	11.1%	18.5%

The Developed Word: A Future of Slower Economic Growth

- ❑ Slowly growing or contracting working-age populations in the developed world will translate into slower growth in GDP.
- ❑ Japan and some faster-aging European countries may face a future of “secular stagnation.”
- ❑ Productivity and living standard growth may also slow as rates of saving and investment decline.
- ❑ Aging workforces may be less flexible, less mobile, and less entrepreneurial, putting a further drag on economic growth.

Average Annual Growth Rate in the Working-Age Population (Aged 20-64), by Decade

	1980s	1990s	2000s	2010s	2020s	2030s	2040s
Canada	1.9%	1.2%	1.4%	-0.1%	-0.1%	0.4%	0.2%
France	1.1%	0.4%	0.8%	0.0%	0.0%	0.0%	0.3%
Germany	1.2%	0.2%	-0.3%	-0.3%	-1.1%	-1.1%	-0.9%
Italy	0.9%	0.2%	0.4%	-0.2%	-0.6%	-1.1%	-0.8%
Japan	0.8%	0.4%	-0.4%	-0.9%	-0.7%	-1.3%	-1.3%
UK	0.7%	0.4%	0.6%	0.2%	0.0%	0.1%	0.2%
US	1.4%	1.3%	1.1%	0.4%	0.1%	0.5%	0.5%

Source: UN Population Division (2013)

The Developing World: Promise of the Demographic Dividend

- ❑ When fertility first falls, the decline in the dependency burden and growth in the working-age population tend to boost per capita GDP.
- ❑ The demographic shift may also encourage higher labor-force participation, higher savings, and greater investment in human capital.
- ❑ The dynamic is called the “demographic dividend,” and it explains between one-third and two-fifths of living standard growth in East Asia since the mid-1970s.

Dependency Ratio of Children (Under Age 20) Plus Elderly (Aged 65 & Over) to Working-Age Adults, 1975–2050

	1975	1990	2010	2030	2050
East Asia	113	80	55	59	79
Eastern Europe	74	68	53	69	83
Greater Middle East	136	127	89	73	71
Latin America	128	106	78	69	74
South Asia	124	109	81	66	66
Sub-Saharan Africa	137	143	130	108	89

Source: UN Population Division (2011)

Working-Age Population (Aged 20-64), as a Percent of the Total Population, 1975–2050

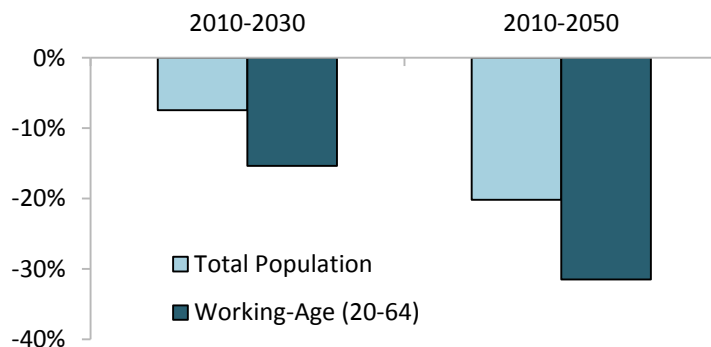
	1975	1990	2010	2030	2050
East Asia	47%	55%	64%	63%	56%
Eastern Europe	58%	60%	65%	59%	55%
Greater Middle East	42%	44%	53%	58%	58%
Latin America	44%	49%	56%	59%	58%
South Asia	45%	48%	55%	60%	60%
Sub-Saharan Africa	42%	41%	44%	48%	53%

Source: UN Population Division (2013)

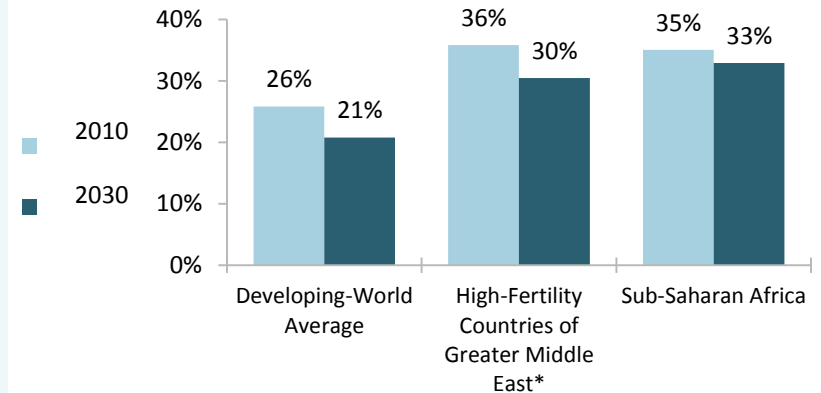
The Developing World: The Uneven Pace of the Demographic Transition

- ❑ In some regions of the developing world, including sub-Saharan Africa and parts of the Greater Middle East, the demographic transition has stalled in its early stages.
- ❑ In other regions, most notably East Asia and Eastern Europe, extremely rapid transitions are leading to “premature aging.”

Percentage Change in the Russian Population, 2010-2050

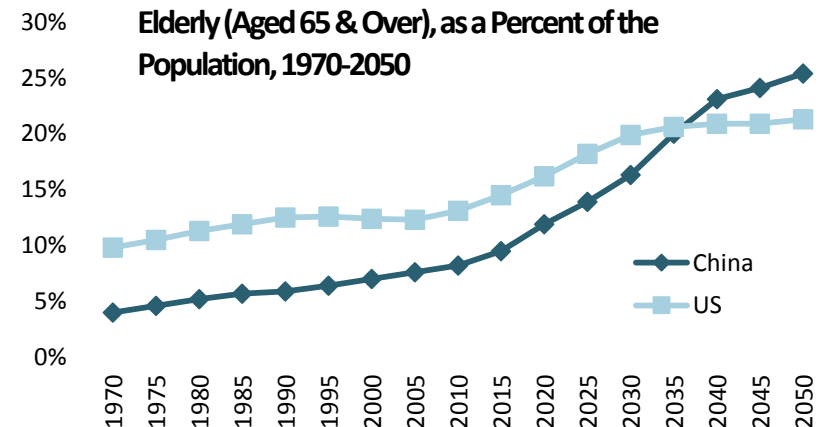


Youth Bulge (15-24) as a Percent of the Adult Population in 2010 and 2030



*Includes Afghanistan, Iraq, Mauritania, Palestine, Sudan, Somalia, and Yemen

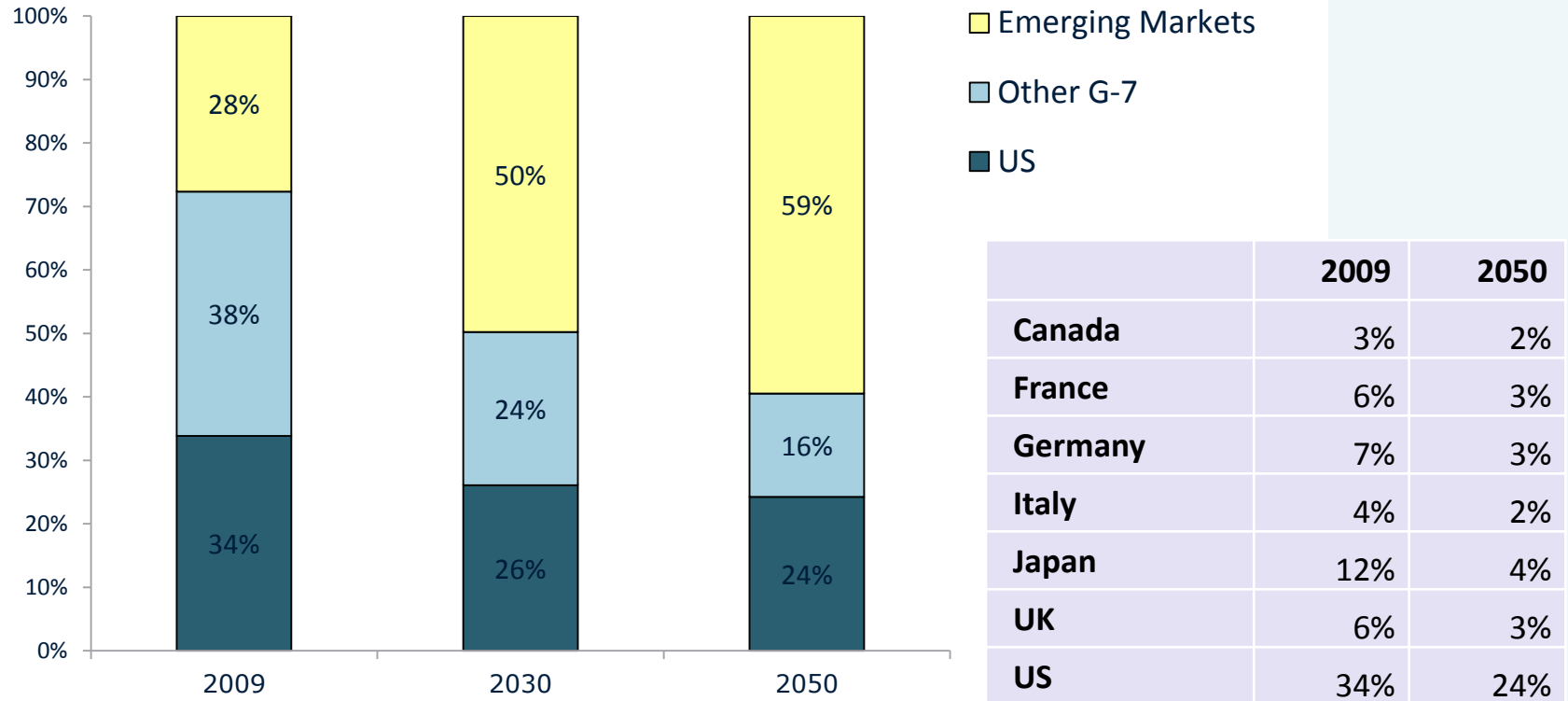
Elderly (Aged 65 & Over), as a Percent of the Population, 1970-2050



Source: UN Population Division (2011 and 2013)

The Developed World: A Future of Relative Economic Decline

GDP (in 2005 US Dollars) by Country or Country Group, as a Percent of G-20 Total, 2009-2050



Source: Carnegie Endowment for International Peace (2010)



MORTALITY ASSUMPTIONS AND LONGEVITY RISK

Implications for pension funds
and annuity providers
Pablo Antolin



Challenges posed by population ageing

- Population ageing: increase median age as a result of increases in life expectancy and low fertility rates.
- Population ageing: baby boom (temporary), increases in life expectancy (permanent)
 - Life expectancy at birth has increased 2.4 years per decade
 - Life expectancy at age 65 has increase at 1.1 years per decade

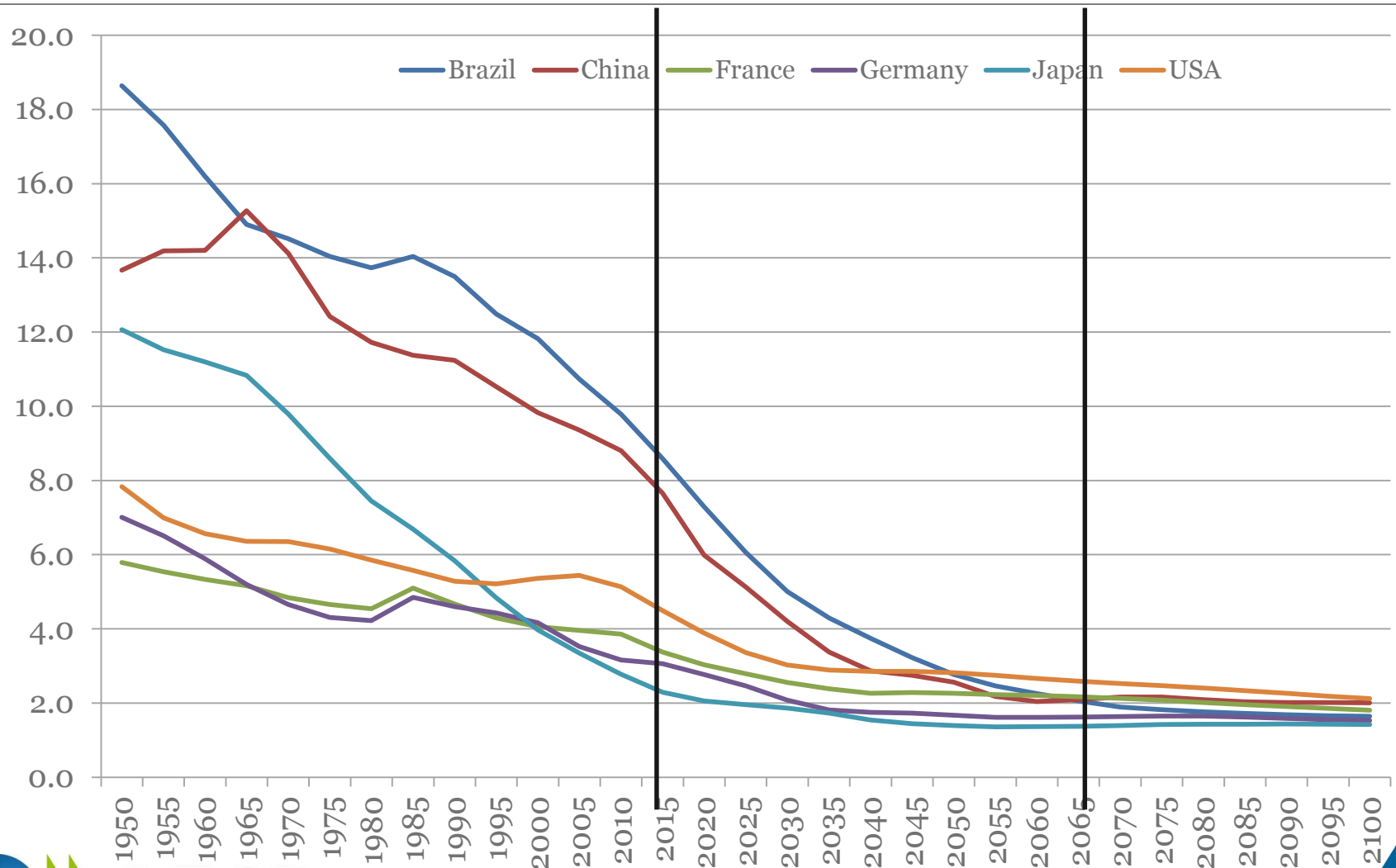


Challenges posed by population ageing

- Challenges for pensions:
 - PAYG public pensions face financial sustainability problems
 - Increasing old-age dependency ratio
 - Defined benefit funded private pensions need to secure their continued solvency
 - Mortality assumptions and provisions fail to account for future improvements in mortality and life expectancy
 - Defined contribution funded private pensions need to address adequacy problems
 - Low return and interest rate environment, longer retirement periods
 - Annuity providers account for future improvements

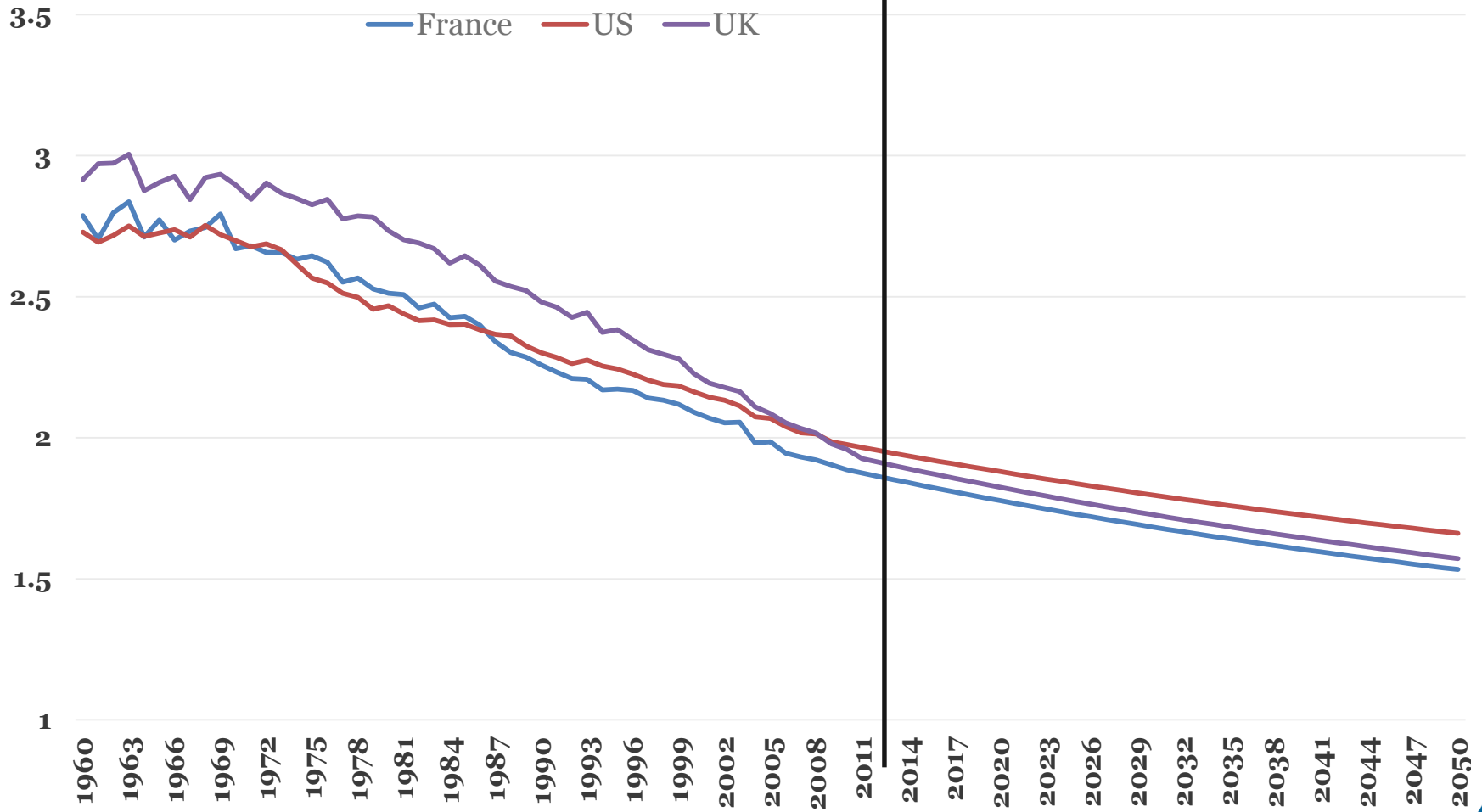


Proportion population 65+ as a proportion working age population



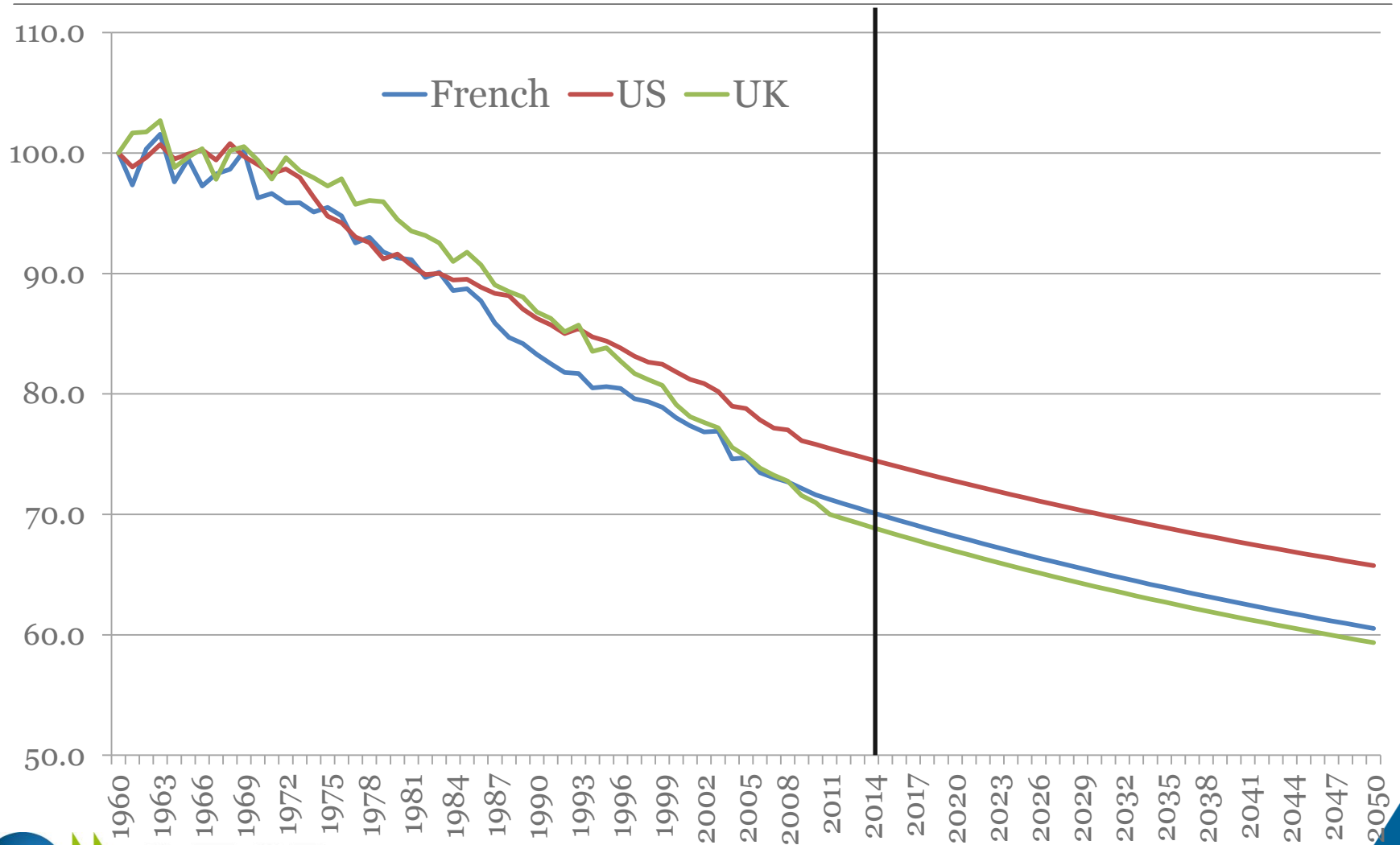


Years contributing (35) to years in retirement (life expectancy at 65)





Annuity payments given actual & projected (LC) changes in life expectancy at 65





Responding to the challenges posed by population ageing and longevity risk

- The cost of the baby boom has already been incurred, therefore, it can only be taken care of by
 - keeping promises and pay them through debt (future generations)
 - reducing their benefits
- Future increases in life expectancy need to be incorporated in the actuarial calculations of pensions, which need to be updated regularly
 - Most common approach: linking statutory retirement age to life expectancy → Problem: mortality and life expectancy levels and improvements are different across socio-economic group (OECD working on this, to be published in June)
 - Linking the number of years contributing to improvements in life expectancy.



Responding to the challenges posed by population ageing and longevity risk

- Main messages:
- **Contributing more and for longer periods, especially by postponing retirement as life expectancy increases, is the best approach to address these challenges**
- **Address the problems posed by the uncertainty on future improvements in mortality and life expectancy**



The uncertainty on future improvements in mortality and life expectancy (longevity risk, LR)

- Focus then on the uncertainty surrounding future improvements in mortality and life expectancy (longevity risk, LR) and how to address LR
- Main objective
 - Respond to the challenges posed by longevity risk
 - Longevity risk is the risk that individuals live longer than assumed, and therefore pension/annuity payments will have to be made for a longer period than planned and provision for.
- OECD work on “Mortality tables and LR”



OECD work on “Mortality tables and LR”

It looks at the mortality tables used by pension funds and annuity providers (regulatory or most commonly used tables) assessing:

- The level of mortality today
- Whether those mortality tables include future improvements in mortality and life expectancy and how

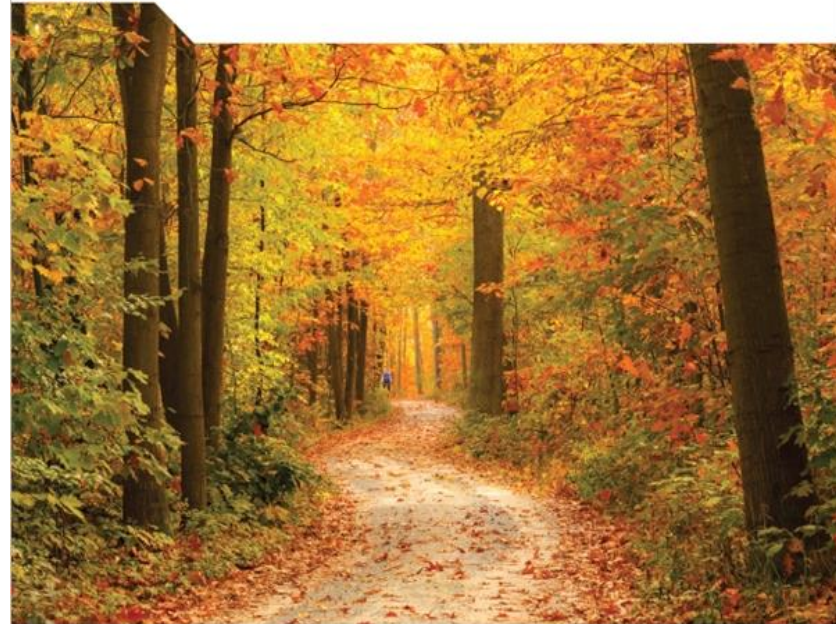
It assesses whether pension funds and annuity providers are exposed to longevity risk: assesses the potential shortfall in provision

Discusses different policy options to manage longevity risk



Mortality Assumptions and Longevity Risk

IMPLICATIONS FOR PENSION FUNDS
AND ANNUITY PROVIDERS



The Impact on Retirement Systems





SOA Longevity Webcast



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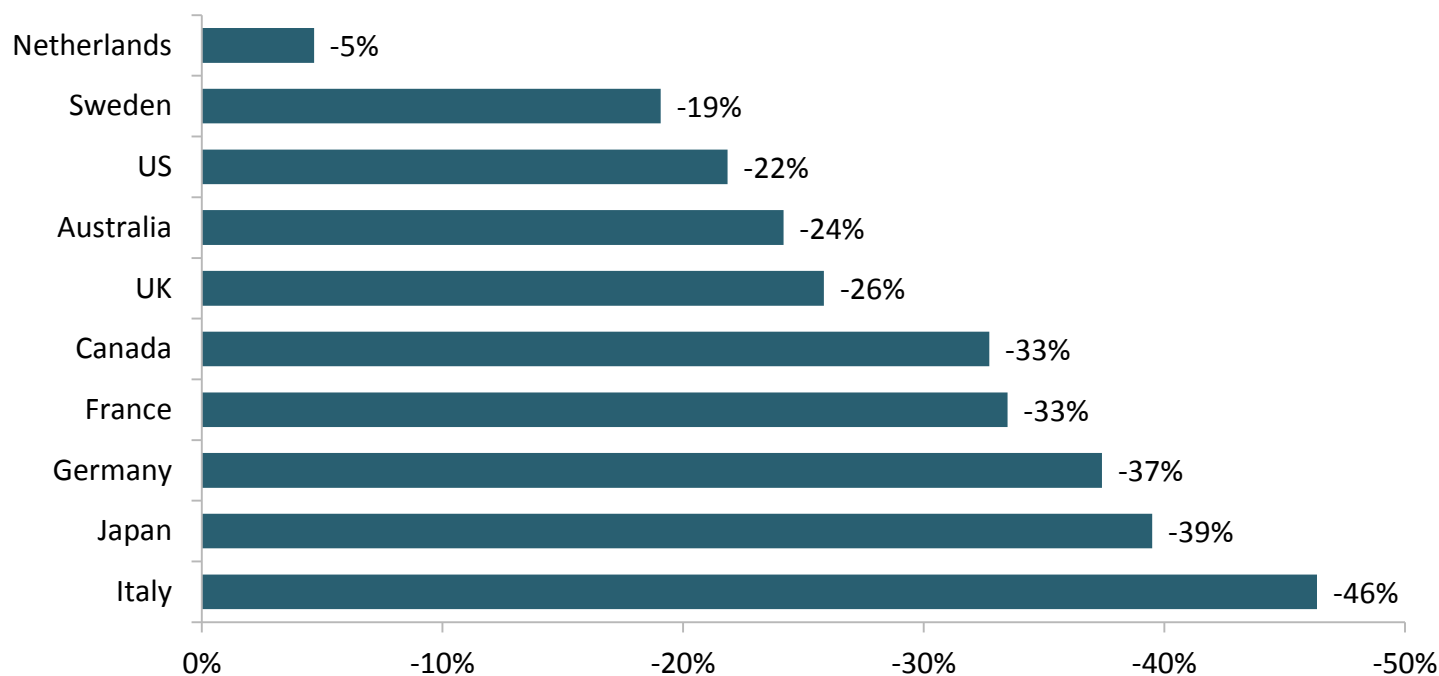


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Many developed countries have made large cuts in the generosity of their public pension systems.

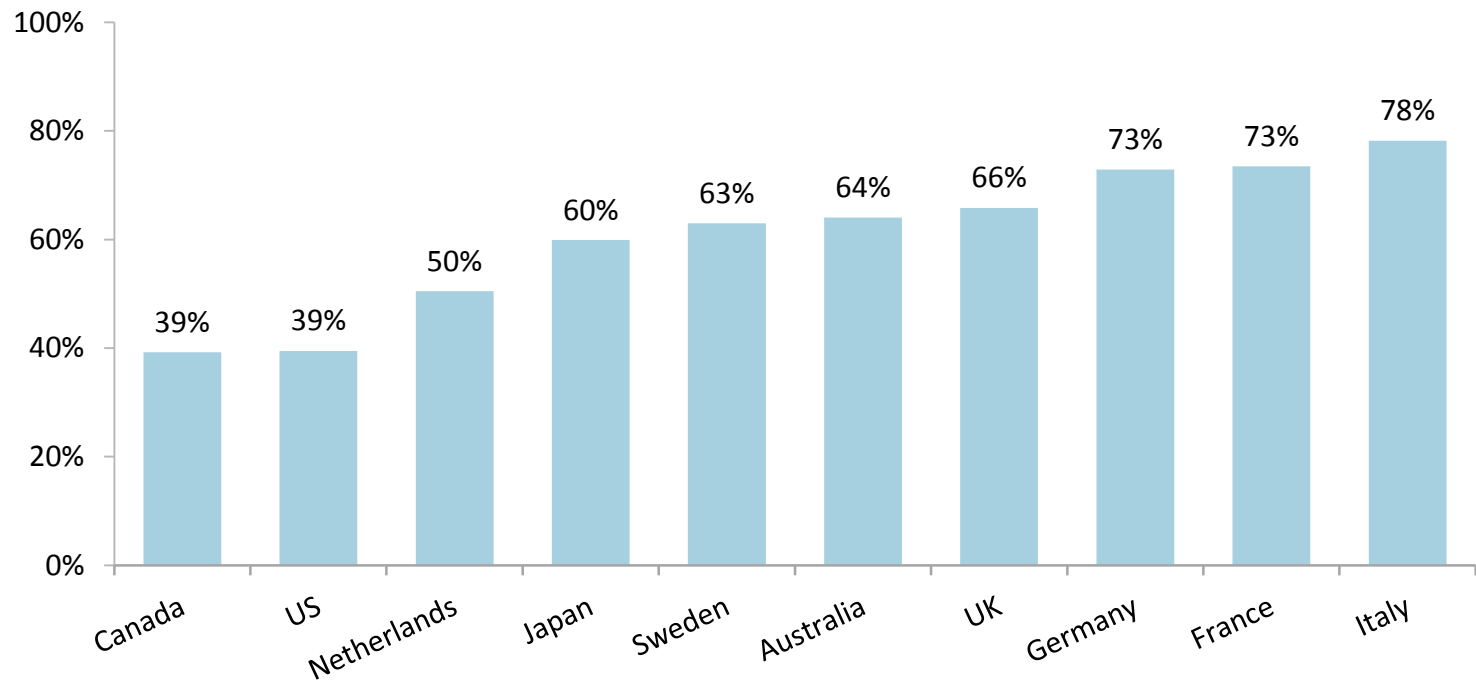
Cumulative Percentage Decline in Current-Law Public Pension Benefits to the Elderly (Aged 60 & Over) Relative to "Current-Deal" Benefits, from 2010 to 2040*



*The "current-deal" projection assumes that retirement ages and replacement rates remain unchanged in the future.

The countries making the deepest cuts in public pension benefits often have the highest levels of elderly dependence on those benefits.

Public Benefits as a Percent of the Cash Income of the Median-Income Elderly (Aged 60 & Over) in 2010*



*Income refers to the third quintile of the elderly income distribution.

Labor-force participation rates for older workers are rising in some developed countries.

Elderly Labor-Force Participation Rate by Age Group, 1990-2010

	Aged 60-64			Aged 60-74		
	1990	2000	2010	1990	2000	2010
Australia	33%	34%	52%	22%*	25%*	40%*
Canada	37%	36%	51%	20%	19%	32%
France	14%	11%	19%	8%	5%	10%
Germany	21%	22%	44%	12%	11%	18%
Italy	22%	19%	21%	12%	10%	11%
Japan	56%	56%	61%	44%	41%	44%
Netherlands	15%	19%	39%	8%	10%	23%
Sweden	58%	53%	65%	25%	26%	34%
UK	38%	38%	46%	19%	19%	27%
US	45%	47%	55%	27%	30%	39%

*Data refer to population aged 60-69.

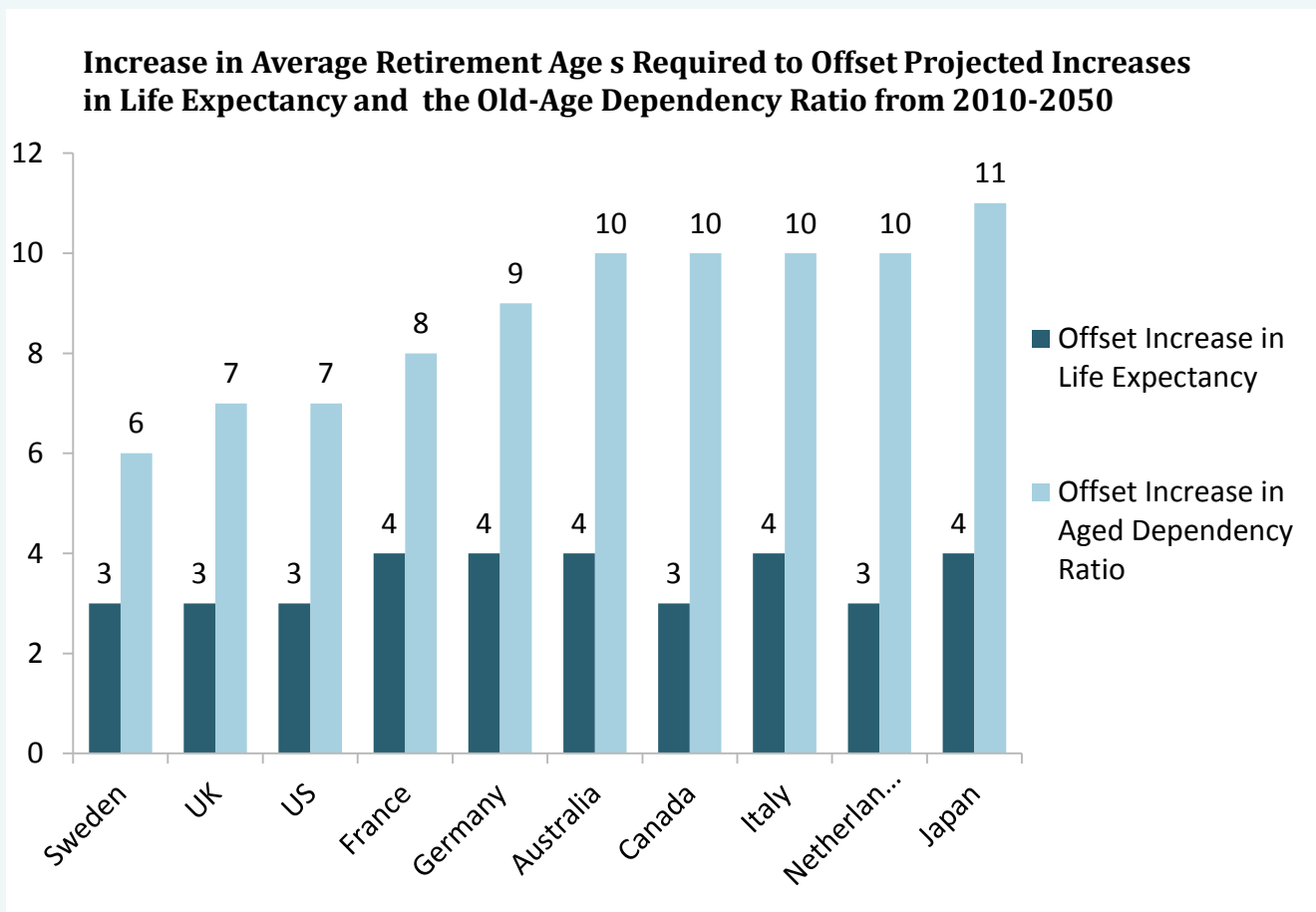
Some developed countries are also making progress in expanding funded pension systems.

Funded Pension Savings as a Percent of Median Elderly Income and GDP in 2010 and 2040*

	Percent of Income		Percent of GDP	
	2010	2040	2010	2040
Australia	15%	34%	4.5%	9.8%
Canada	33%	35%	5.6%	7.9%
France	1%	2%	0.3%	0.4%
Germany	5%	14%	0.8%	3.3%
Italy	5%	10%	1.1%	2.8%
Japan	14%	15%	2.6%	3.3%
Netherlands	30%	29%	4.9%	7.5%
Sweden	10%	21%	1.9%	4.8%
UK	18%	22%	3.9%	5.4%
US	31%	34%	5.9%	8.1%

*Income refers to the third quintile of the elderly income distribution.

Very large additional increases in average retirement ages would be required to offset the aging of the population.



Source: UN Population Division (2013) and author's calculations.

Developing countries must put in place adequate substitutes for informal family support networks.

Average Number of Surviving Children of the Elderly: 2010-2040 and Change from 2010 to 2040

	2010	2020	2030	2040	Change		2010	2020	2030	2040	Change
1 Sweden	2.0	1.7	1.8	2.0	-0.1	11 Australia	2.7	2.1	2.0	2.0	-0.8
2 Poland	2.3	2.3	2.2	2.0	-0.3	12 Italy	2.2	2.1	1.4	1.4	-0.9
3 Russia	1.9	1.7	1.7	1.5	-0.4	13 Canada	2.6	1.8	1.6	1.7	-0.9
4 UK	2.3	1.8	1.8	1.9	-0.4	14 Chile	3.4	2.7	2.5	2.4	-1.0
5 France	2.4	1.9	1.8	1.9	-0.4	15 India	3.8	3.7	3.2	2.6	-1.1
6 Japan	2.0	1.9	1.7	1.5	-0.5	16 Spain	2.7	2.2	1.5	1.4	-1.2
7 Germany	1.9	1.4	1.4	1.4	-0.5	17 Korea	3.6	2.6	1.7	1.8	-1.7
8 Switzerland	2.0	1.6	1.5	1.6	-0.5	18 Brazil	3.9	3.1	2.4	2.1	-1.7
9 US	2.5	1.9	1.8	1.9	-0.6	19 China	4.3	3.3	2.2	2.0	-2.3
10 Netherlands	2.3	1.6	1.6	1.6	-0.6	20 Mexico	5.0	4.1	3.1	2.6	-2.4

Note: Countries are ranked from lowest to highest according to the projected change from 2010 to 2040.



MORTALITY ASSUMPTIONS AND LONGEVITY RISK

Implications for pension funds
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Mortality assumptions and longevity risk: Approach

1. We look at the mortality tables used by pension funds and annuity providers (regulatory or most commonly used tables) assessing:
 - The level of mortality today
 - Whether those mortality tables include future improvements in mortality and life expectancy and how
2. It assesses whether pension funds and annuity providers are exposed to longevity risk: assesses the potential shortfall in provision
 - Using 4 standard mortality projections models (LC, CBD, S-plines, CMI) and comparing the results with what the commonly used mortality tables indicate
3. Discusses different policy options to manage longevity risk



Main messages

- The regulatory framework does not always require accounting for mortality improvements.
- Standard mortality tables used by pension funds and annuity providers are not always sufficient given recent trends in life expectancy
- To manage longevity risk
 - Regulators/policy makers should ensure that pension funds and annuity providers use regularly updated mortality tables, which incorporate future improvements.
 - Capital markets can offer additional capacity to mitigate LR by addressing the need for transparency, standardization and liquidity: use indexed-based financial instruments
 - Regulatory framework should recognized the reduction in risk exposure these instruments offer
 - Governments could facilitate transparency, standardization and liquidity by issuing longevity indices to serve as a benchmark



Questions addressed

- What is *current regulation and practice* with respect to the use of mortality tables for the valuation of pension and annuity liabilities?
- Are the *standard mortality tables* used by pension funds and annuity providers *sufficient* given recent trends in life expectancy?
- What are the *policy implications* to encourage and facilitate the recognition and management of longevity risk?



Mortality assumptions: regulatory requirements

- Is there a minimum requirement for the **level of mortality** assumed?
- Is there a regulatory requirement to account for **future improvements** in mortality?
- **Minimum requirements** are more common for **pension plans**
- **Half** of the countries have **no requirement** to account for **mortality improvements** for both pension funds and annuity providers

Country	Minimum Requirement		Improvement Requirement	
	Annuity providers	Pension plans	Annuity providers	Pension plans
Brazil	No	Yes	No	No
Canada	No	Yes	Yes	Yes
Chile	Yes	Yes	Yes	Yes
China	Yes	Yes	No	No
France	Yes	Yes	Yes	Yes
Germany	Yes	Yes/No	Yes	Yes
Israel	Yes	Yes	Yes	Yes
Japan	No	Yes	No	No
Korea	No	No	No	No
Mexico	Yes	No	Yes	No
Netherlands	No	No	Yes	Yes
Peru	Yes	Yes	No	No
Spain	No	No	Yes	Yes
Switzerland	No	No	No	No
United Kingdom	No	No	Yes	Yes
United States	Yes	Yes	No	Yes



Mortality assumptions: market practice in accounting for improvements

- Are mortality **improvements** typically accounted for given **market practice**?
- Most of countries **account for future mortality improvements** in practice
- **Annuity providers** tend to **assume improvements** in mortality **more often** than pension funds

Country	Annuity providers	Pension plans
Brazil	No	No
Canada	Yes	Yes
Chile	Yes	Yes
China	No	No
France	Yes	Yes
Germany	Yes	Yes
Israel	Yes	Yes
Japan	Yes	No
Korea	No	No
Mexico	Yes	No
Netherlands	Yes	Yes
Peru	Some	Some
Spain	Yes	Yes
Switzerland	Yes	Some
United Kingdom	Yes	Yes
United States	Yes	Yes



Questions addressed

- What is *current regulation and practice* with respect to the use of mortality tables for the valuation of pension and annuity liabilities?
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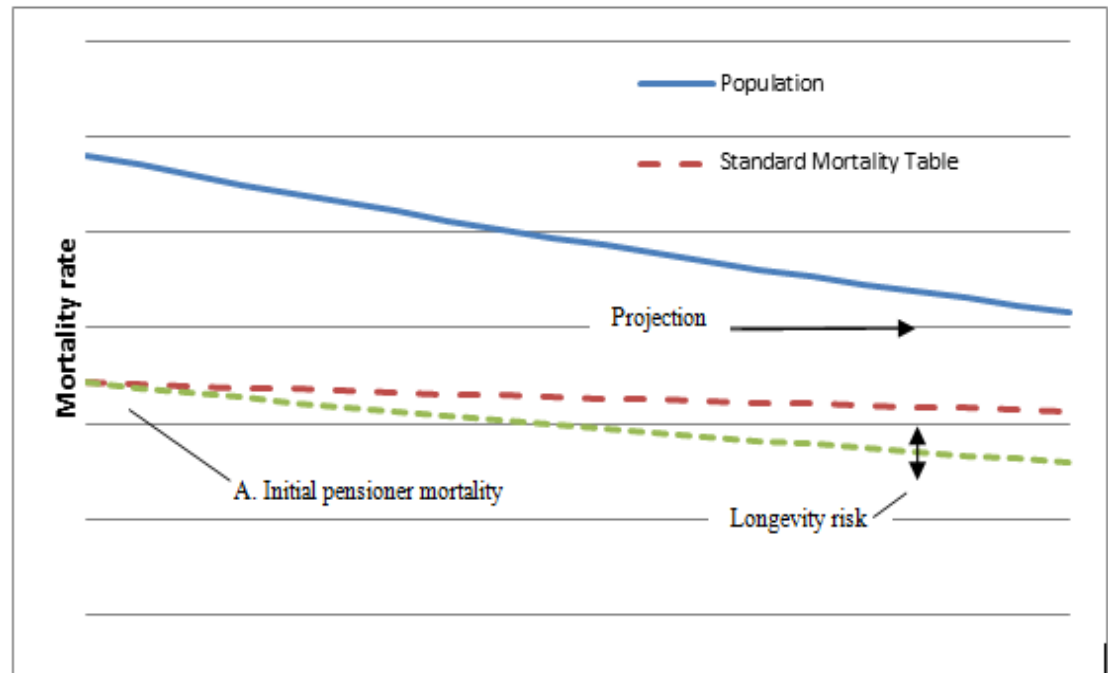
Approach to quantify potential shortfall of standard mortality tables (1/2)

- What is the value of the ***additional reserves*** needed to meet future pension and annuity payments given the ***difference btw assumed future mortality and expected future mortality***?
- **Metric:** compare life expectancies and annuity values
 - **Life expectancy** – expected differences in the length of payments
 - **Annuity value** – expected differences in the cost of meeting payments
 - Driven by expected ***length of payments*** (mortality) and ***time value of money*** (discount rate)
- **Forming expectations:** quantitative outputs and qualitative judgement
 - Projection models
 - Lee Carter, Cairns-Blake-Dowd, P-spline and CMI models
 - Interpretation of results
 - Pros/cons of each type of model
 - Consideration of the historical context



Approach to quantify potential shortfall of standard mortality tables (2/2)

- **Model Output:** population mortality
 - Population life expectancy vs. pensioner/annuitant life expectancy
 - Mortality differences relating to socio-economic factors
 - Level of differences depend on structure and coverage of pension system
- **Arriving at comparability:** need to adjust for differences
 - Starting at the same place
 - Assume mortality experience used to create the standard table was an accurate representation of the pensioner/annuitant mortality
 - Evolving in the same way
 - Assume the same proportional decrease in the mortality of both populations





Potential shortfall of pension/annuity provisions based on standard mortality tables

Classification	Potential Shortfall	Pension Plans	Annuity Providers
Serious	10-20%	Brazil (US 1983IAM), China (CL2000-2003), Switzerland (EVK2005)	Brazil (US Annuity 2000), China (CL2000-2003)
Significant	5-10%	Canada (UP94-ScaleAA), Japan (EPI2005), US (RP2000-ScaleAA)	
Moderate	2-5%	Chile (RV2009), Spain (PERM/F C 2000)	Brazil (BR-EMS 2010), Canada (GAM94-CIA), Chile (RV2009), Spain (PERM/F C 2000) US (GAM94-ScaleAA)
Monitor	<2%; specific issues to address	Canada (CPM), France (TGH/F 2005), Israel , Mexico (EMSSA 1997), Spain (PERM/F P 2000) Switzerland (BVG 2010, VZ 2010), US (RP2000-ScaleBB)	France (TGH/F 2005), Israel , Mexico (EMSSA 2009), Japan (SMT 2007), Spain (PERM/F P 2000)
OK	little to no expected shortfall	Netherlands (AG-Prognosetael 2010), UK (SAPS1-CMI), UK (SAPS2-CMI), US (RP2014-MP2014)	Germany (DAV 2004 R), Netherlands (AG-Prognosetael 2010), Switzerland (ERM/F 2000), UK (PCMA/PCFA 2000-CMI)



Questions addressed

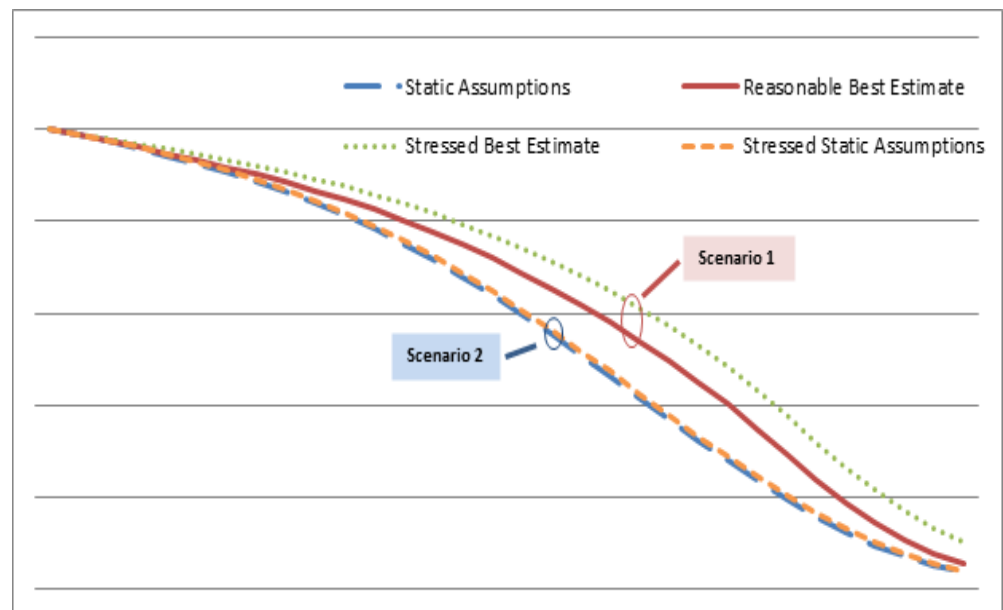
- What is *current regulation and practice* with respect to the use of mortality tables for the valuation of pension and annuity liabilities?
- Are the *standard mortality tables* used by pension funds and annuity providers *sufficient* given recent trends in life expectancy?
- What are the *policy implications* to encourage and facilitate the recognition and management of longevity risk?



Longevity risk

- Expected vs. unexpected risk
 - **First** need to make sure **mortality assumptions are in line with expectations** to address expected improvements in life expectancy
 - **Secondly** need to assess the **financial impact of additional unexpected increases** in life expectancy, and decide how much risk to retain or mitigate
- Must first have a reasonable estimation of expected pension/annuity liabilities to be able to assess the impact of unexpected increases in longevity
 - The financial impact of a 25% decrease in mortality will not be the same if assumptions include no improvements (Scenario 2)

Future pension payments using different mortality assumptions





Summary of Policy Implications

1. The regulatory framework should ensure that pension funds and annuity providers use **appropriate mortality tables** to account and provision for expected future improvements by **establishing clear guidelines** for the development of mortality tables used for reserving for annuity and pension liabilities.
2. Governments should **facilitate the measurement of mortality** for the purposes of assumption setting and the evaluation of basis risk of index-based hedging instruments.
3. The regulatory framework should **provide incentives for the management and mitigation of longevity risk**.
4. Governments **should encourage the development of a market for instruments to hedge longevity**, particularly index-based instruments, **by facilitating transparency and standardization of longevity hedges** in order to ensure the capacity for pension plans and annuity providers to continue to provide longevity protection to individuals.



1) Use appropriate mortality tables

1. Tables should account for the expected **future improvements** in mortality
 - Analysis showed that tables which do not account for improvement risk having a shortfall of provisions of over 10%
 - For countries assessed, accounting for mortality improvements add 2-2.5 years of life expectancy at age 65 on average
2. Tables should be **regularly updated**
 - This will ensure tables are in line with recent mortality experience and limit the impact of reserve increases
3. Tables should be based on the **relevant population**
 - Life expectancy and pensioner/annuitant mortality can vary significantly from one country to the next and across various sub-groups of the population



2) Facilitating the measurement of mortality

- **Accurate and timely mortality data** should be available, preferably by age, gender and socio-economic groups



3) Encouraging the management and mitigation of longevity risk

- Capital and funding requirements should **reflect the risk profile** of the liabilities
 - Reduction of longevity risk should reduce capital requirements and increase funding ratios
 - E.g. risk based requirements which could be based on distributions provided by stochastic models
- Accounting standards should ensure the **appropriate valuation of hedging instruments**
 - Longevity hedging instruments should be allowed to offset the value of the liabilities



4) Facilitating the transparency and standardisation of longevity hedges (1/3)

- Common options for hedging longevity risk
 - Bulk Annuities
 - Full Transfer of all risks including investment risk
 - Longevity Swaps
 - Fixed payments made by the pension fund/annuity provider in exchange for floating payments based on the evolution of underlying mortality
 - Bespoke or index-based
- Need for financial instruments to enable pension funds and annuity providers to mitigate longevity risk
 - Capacity constraints
 - Limits of diversification
 - Risk-based capital requirements
 - Increased focus on risk-management



4) Facilitating the transparency and standardisation of longevity hedges (2/3)

- Misalignment of incentives between pension fund/annuity provider and investor
 - Several barriers for capital markets investors taking bespoke transactions
 - Asymmetrical information
 - Time consuming to perform the risk analysis
 - Very long duration
 - Pension funds and annuity providers would prefer a bespoke hedge
 - Risk is fully hedged; no basis risk
 - Limited data available on which to measure and assess basis risk
- **Index-based instruments** could resolve this misalignment and are by nature more transparent and standardised than bespoke transactions



4) Potential measures to facilitate transparency and standardisation of longevity hedges (3/3)

- Regularly publish a **longevity index** to provide an anchor for pricing of longevity instruments
 - Metrics for both current mortality as well as projections reflecting the most up-to-date expectations
 - Governments have access to the underlying data needed and could produce reliable and regular figures
- **Consider** the issuance of a **longevity bond** to provide a benchmark for pricing
 - Must be considered with care given the significant existing exposure of many governments to longevity risk
- Bring **over-the-counter transactions** into **exchanges**
 - Increase the transparency of such transactions and promote liquidity on the secondary market



Conclusions

- *Expected longevity risk* is unavoidable and must be accounted for in mortality assumptions used to value pension and annuity liabilities
 - *Current Level*: Mortality tables should be regularly updated based on relevant data
 - *Trend*: Mortality improvements should be accounted for
- The regulatory framework should be reflective of and reactive to changes in exposure to *unexpected longevity risk* to encourage the measurement and management of the risk
 - Accounting standards and solvency requirements
- The transparency and standardisation of longevity hedges should be facilitated to *ensure available capacity for longevity risk*
 - Data availability
 - Reliable benchmarks



What's Next?





MORTALITY ASSUMPTIONS AND LONGEVITY RISK

Implications for pension funds
and annuity providers
Pablo Antolin



Way forward

- The cost of the baby boom has already been incurred, therefore, it can only be taken care of by
 - keeping promises and pay them through debt (future generations) or
 - reducing their benefits
- **Future increases in life expectancy** need to be incorporated in the actuarial calculations of pensions, which need to be updated regularly
- We need to assess the impact that **differences in mortality and life expectancy improvements among different socio-economic groups** have on policy options:
 - linking statutory retirement age to life expectancy or the number of years contributing to keep its ratio to years in retirement constant?
 - Better tailor retirement solutions to the needs of different segments of society: new annuity products (enhance annuities)
 - Policy makers need to be aware of these differences to ensure that the general rules governing the access to pensions and retirement savings do not penalise those in lower socioeconomic groups.



Way forward

- Contributing more and for longer periods, especially by postponing retirement as life expectancy increases, is the best approach to address these challenges
- Address the problems posed by the uncertainty on future improvements in mortality and life expectancy



Way forward

- Regulators and policy makers should ensure that pension funds and annuity providers use regularly updated mortality tables, incorporating future improvements.
- Capital markets can offer additional capacity to mitigate LR by addressing the need for transparency, standardization and liquidity:
 - Indexed-based financial instruments
- Regulatory framework should recognized the reduction in risk exposure these instruments offer
- Governments could facilitate transparency, standardization and liquidity by issuing longevity indices to serve as a benchmark



THANK YOU
VERY MUCH!
QUESTIONS OR COMMENTS
WELCOME

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SOA Longevity Webcast



Richard Jackson
President
Global Aging Institute



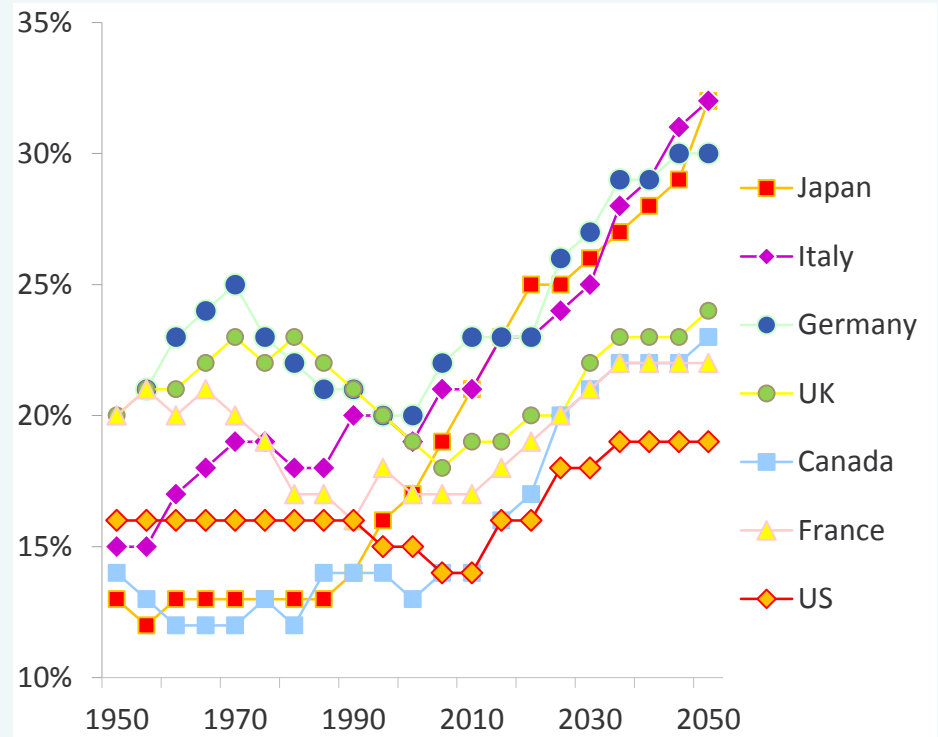
Society of Actuaries

February 3, 2016

Four Big Questions

- Can aging societies balance the twin goals of retirement policy: income adequacy and fiscal sustainability?
- Which will fall more as societies age—savings or investment demand? In other words, are we headed toward a future of capital surpluses or capital shortages?
- Are health spans rising along with life spans?
- How will population aging affect social mood? Will aging societies have shorter time horizons and become more risk averse?

Share of the Population with Less than 20 Years of Life Remaining, by Country, 1950-2050



Source: Author's calculations based on UN Population Division (2007) and Human Mortality Database (UC Berkeley and Max Planck Institute for Demographic Research)

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March 10, 2016