



Institute
and Faculty
of Actuaries

Research Materials for Conference Presentation only. Not intended for public dissemination.

Global Macro Demographics & Pensions: Investments & Risks

Amlan Roy, PhD

Senior Managing Director, Global Chief Retirement Strategist, State Street Global Advisors
amlan_roy@ssga.com

For **Contact details** of team members please see contacts page at the back of the presentation.
All the information contained in this presentation is as of date indicated unless otherwise noted.



Institute
and Faculty
of Actuaries

Risk and Investment Conference 2018

Brighton, 27–28 June 2018

Demographics: A Different Perspective

WHAT IT CONNECTS TO & INFLUENCES

D: Discount rates, Debt

E: Economic Growth, Efficiency, Structure

M: Mortality

O: Organisation Behaviour, Structure

G: Geography, Geopolitics, Governance

R: Robotics, Real Estate

A: Asset Prices, Asset Allocation

P: People, Pensions, Politics

H: Heterogeneity, Households

I: Inflation, Inequality, Institutions

C: Consumers, Culture, Cities

S: Sustainability

WHO DOES IT PERTAIN TO?

All the “People” in the world and their characteristics. From an economic perspective, we restrict attention to them as “consumers and workers” in the world.

It affects all Income Statements & Balance sheets in the world for

- Individuals
- Households
- Corporates
- Nations

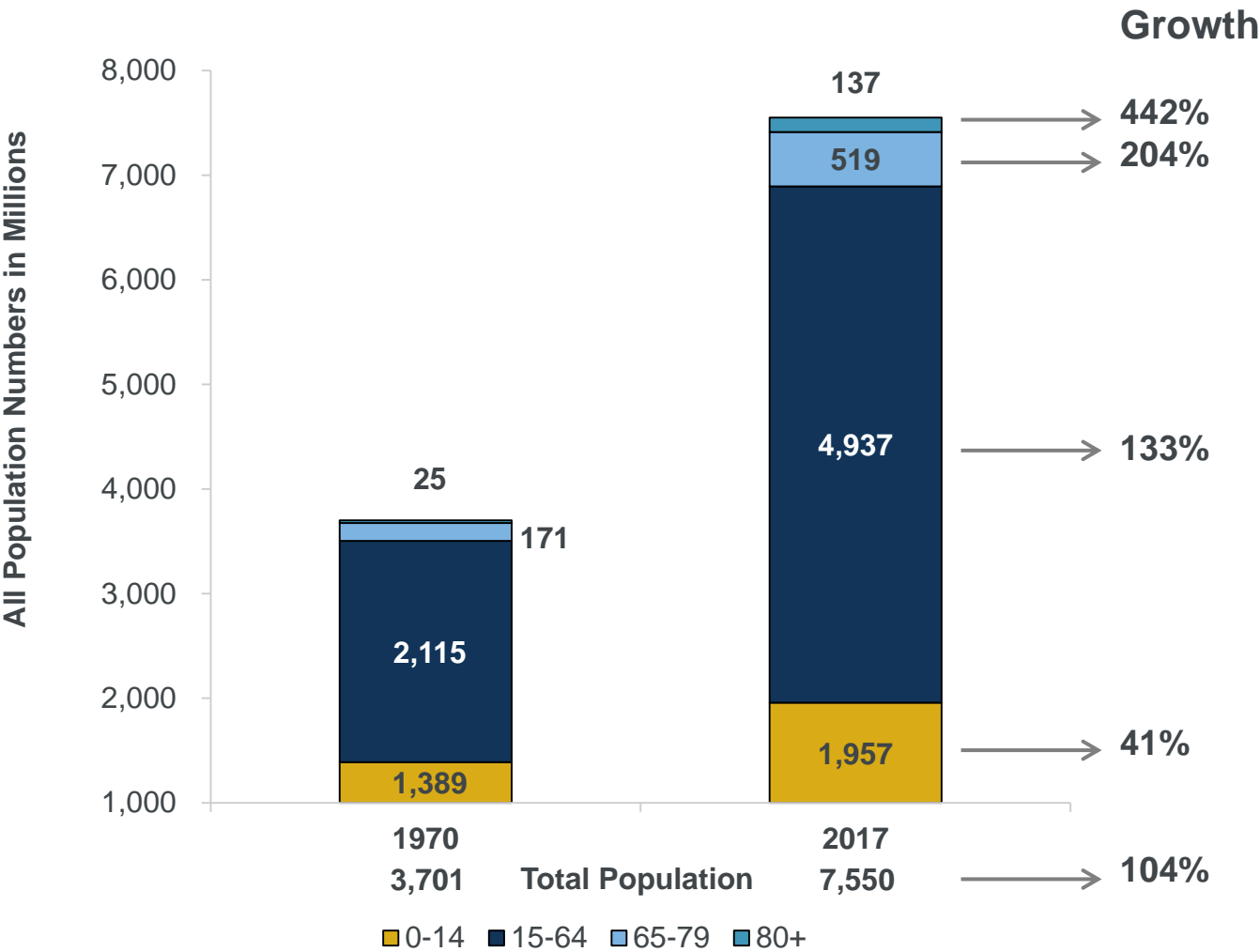
Unless otherwise stated, all data sourced to “UN” is the most current data attributable to the United Nations Population Division. Data shown beyond 2015 is a UN projection.



Institute
and Faculty
of Actuaries

Super-old (80+) Age Group Fastest Growing

World Population: 1970 versus 2017



Share of 80+ Population

	1970 (%)	2017 (%)
UK	2	5
US	2	4
Germany	2	6
Japan	1	8
France	2	6
Italy	2	7

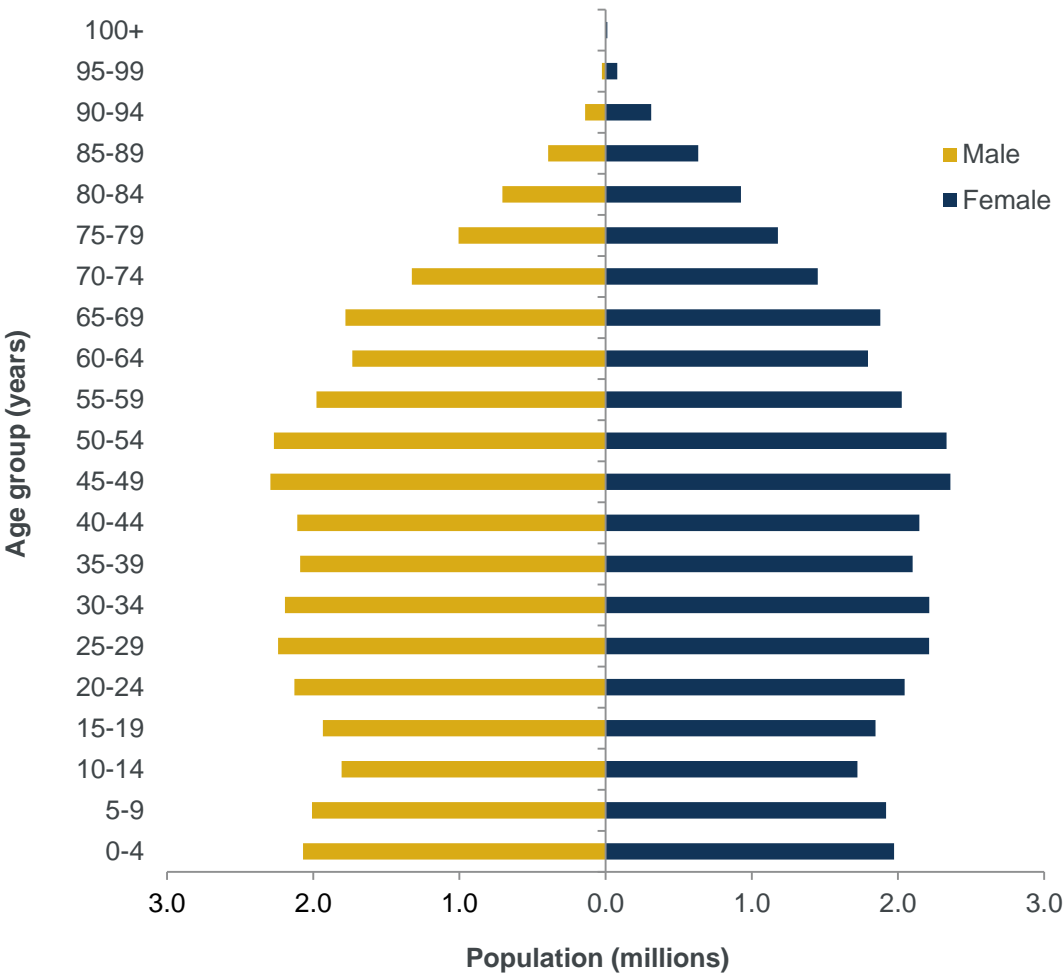
Source: UN, CS, SSGA Demographics



Institute
and Faculty
of Actuaries

Share of 20+, 60+, 80+ & 100+ age groups

UK Population, 2015



% of Total Population

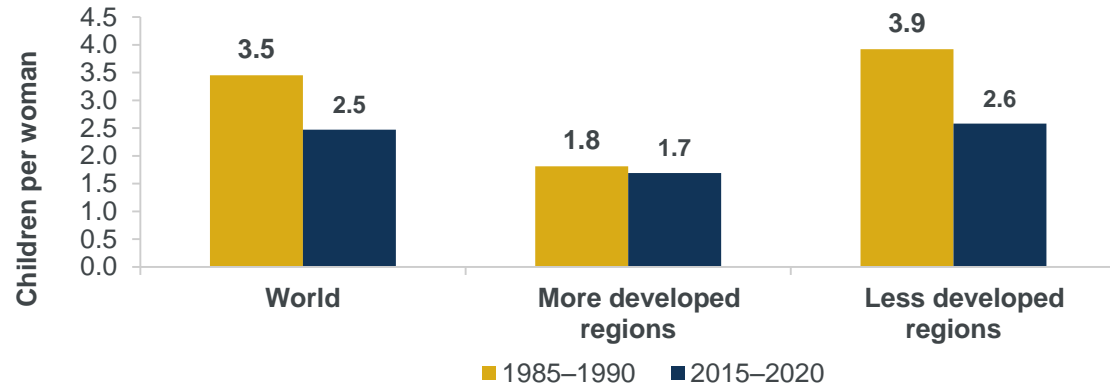
	Age group 20+	Age group 60+	Age group 80+	Age group 100+
UK	76.6	23.5	4.9	0.023
World	65.8	12.3	1.7	0.006

Source: UN, SSGA Demographics

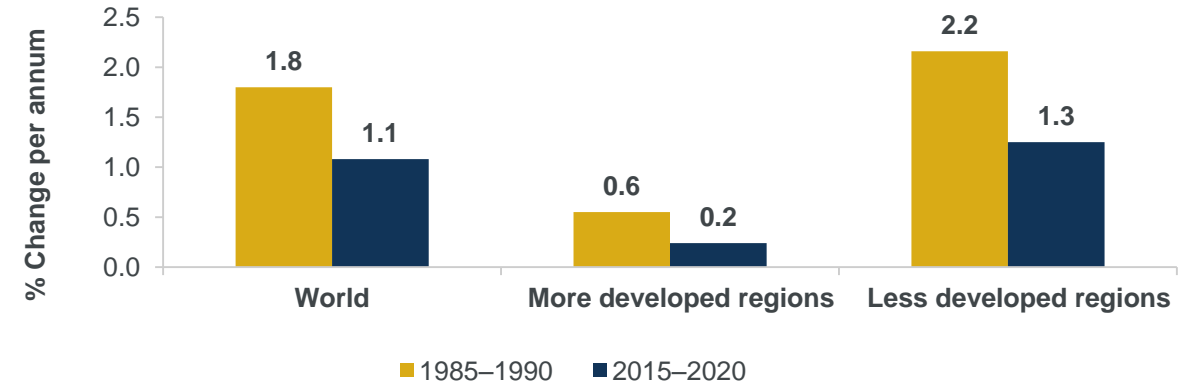


Core Demographics: World, Less & More Developed

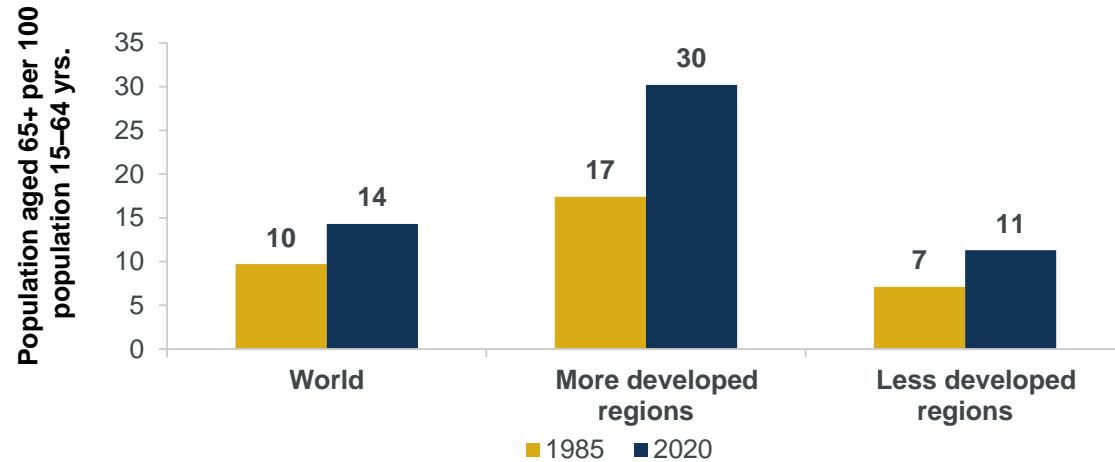
Total Fertility Rate



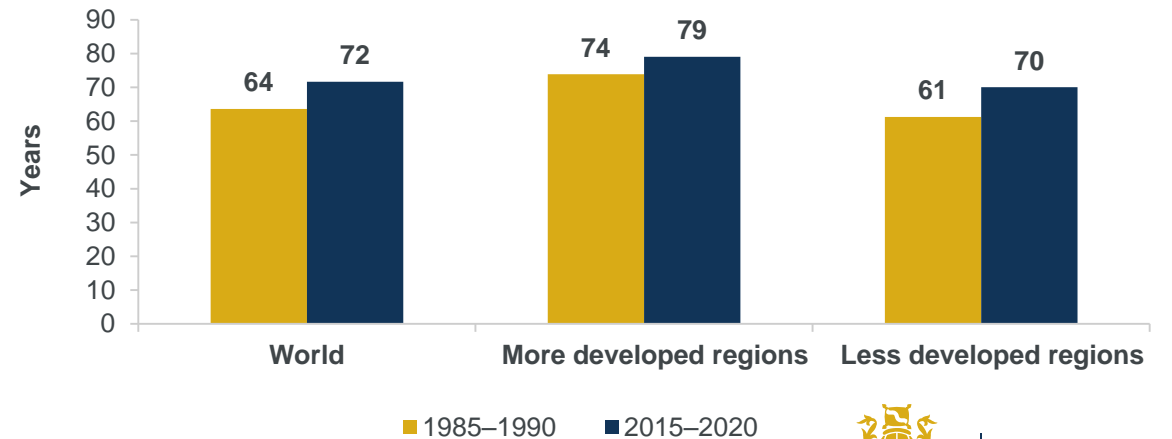
Population growth annual average



Old Age Dependency Ratio



Life Expectancy at Birth



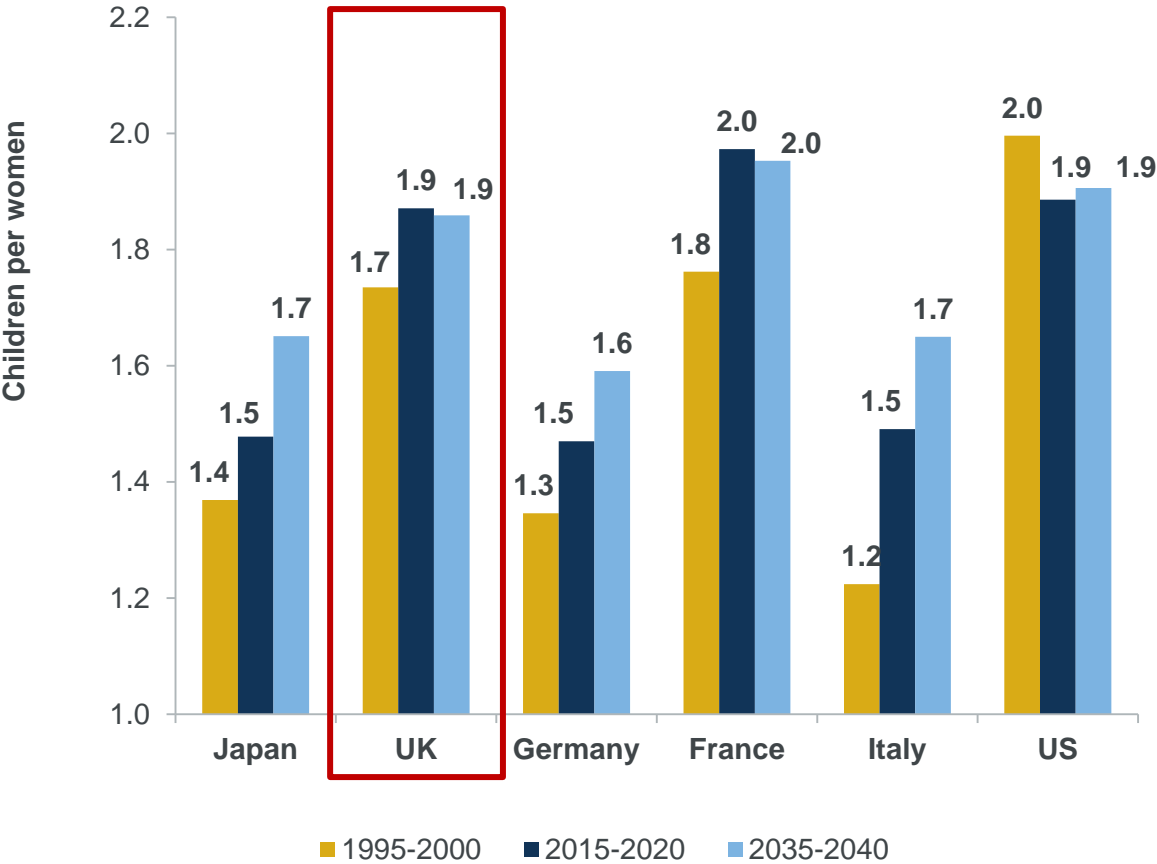
Source: UN, SSGA Demographics



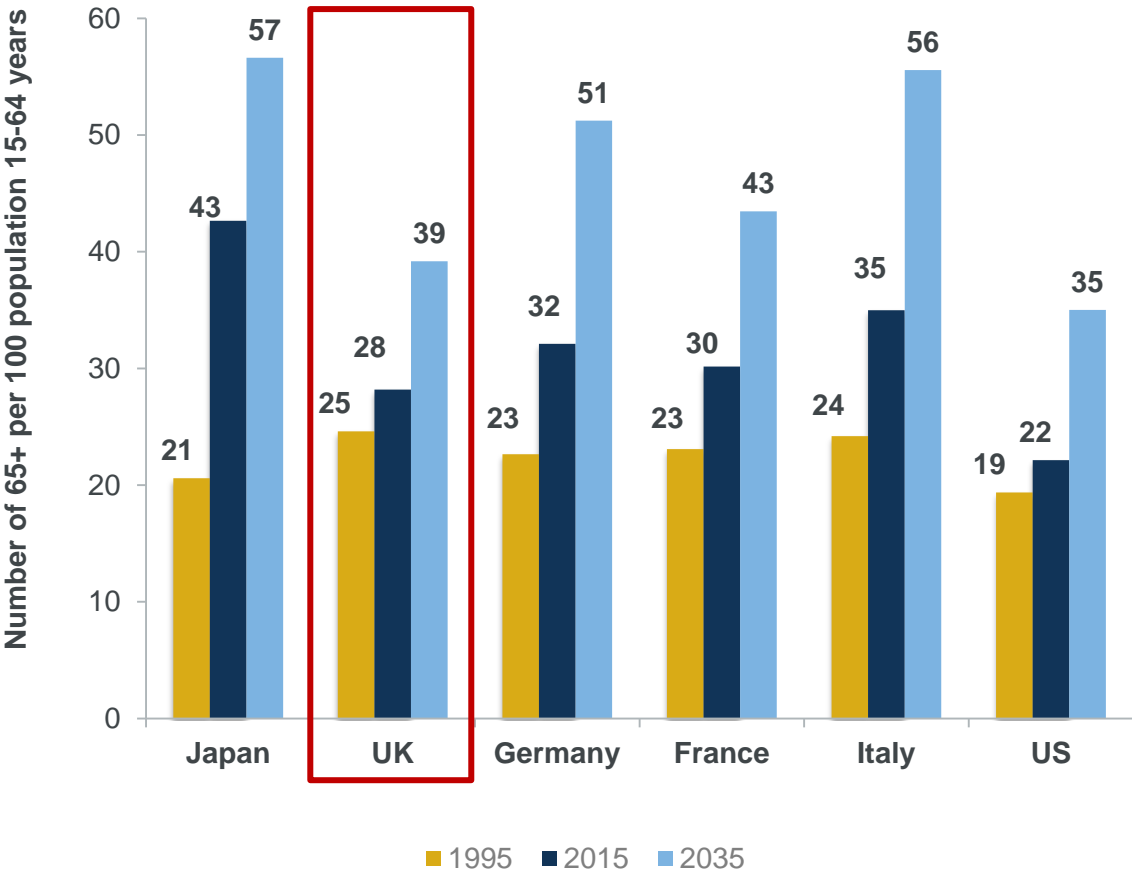
Institute
and Faculty
of Actuaries

Core Demographics: G6

Fertility Rate



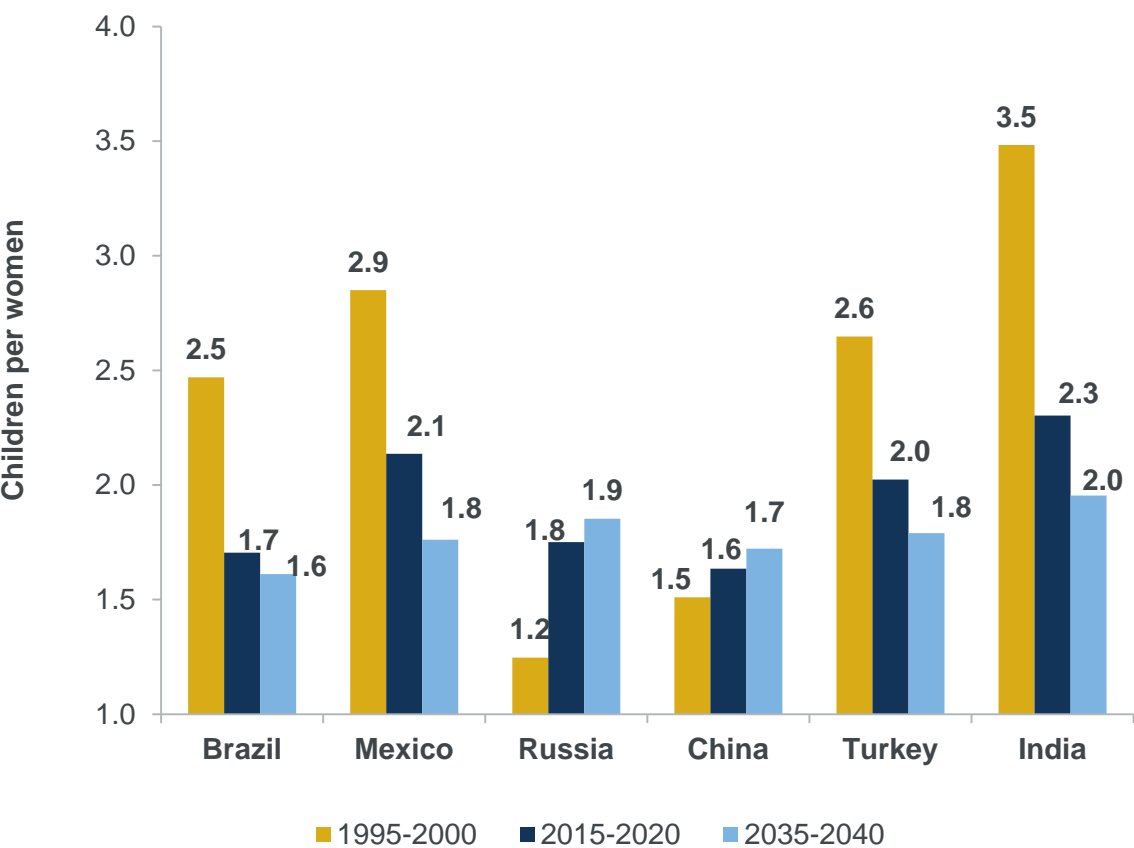
Old Age Dependency Ratio



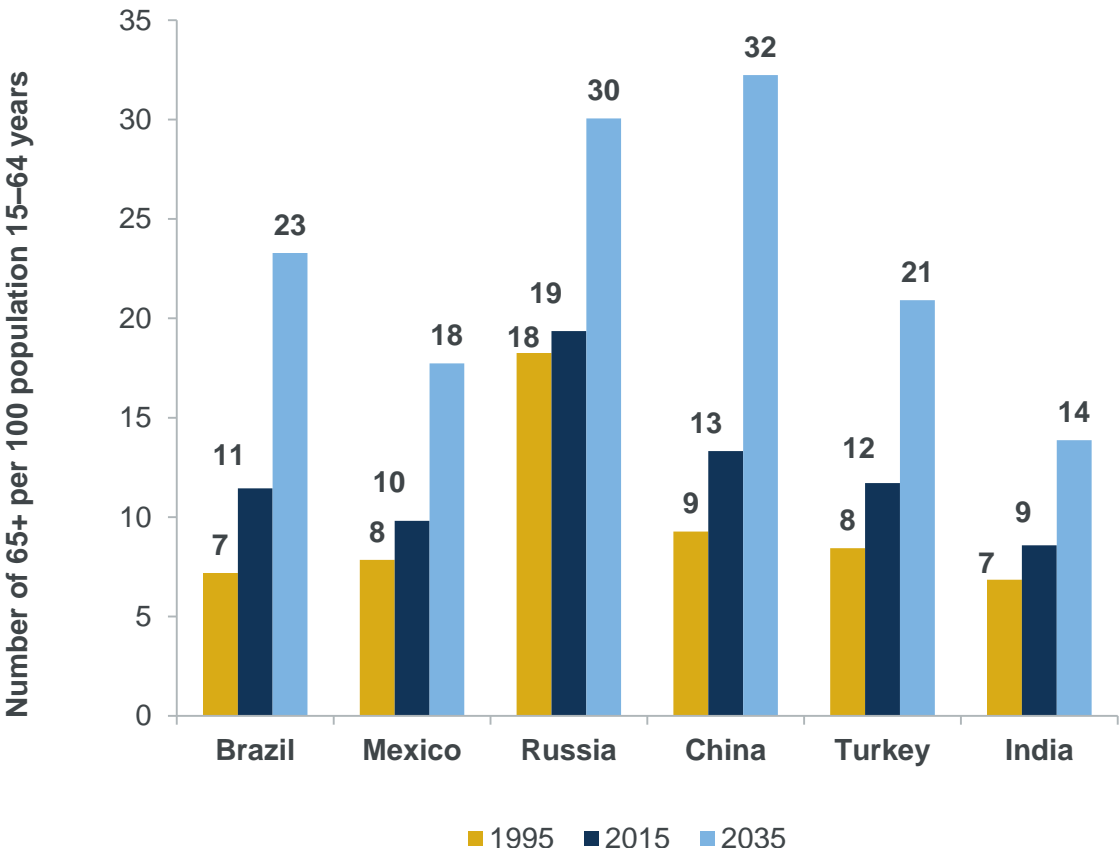
Source: UN, SSGA Demographics

Core Demographics: EMG6

Fertility Rate



Old Age Dependency Ratio



Source: UN, SSGA Demographics



The Demographic Manifesto (2000)

Radical Policy Actions to mitigate the Ageing Time Bomb

- **Abolish Mandatory retirement ages.** Adopt Flexible retirement.
- **Close** gender gaps to better utilize female work potential
- **Rethink & implement** immigration policies
- **Outsource and off-shore** non-core jobs based on costs and benefits

Retirement Ages: Effective & Official (2016)

Retirement Age (Years)	Men		Women	
	Effective	Official	Effective	Official
Korea	72.0	61.0	72.2	61.0
Mexico	71.6	65.0	67.5	65.0
Turkey	66.1	60.0	66.3	58.0
Japan	70.2	65.0	68.8	65.0
Switzerland	66.0	65.0	64.3	64.0
United States	66.8	66.0	65.4	66.0
United Kingdom	64.6	65.0	63.2	63.0
Italy	62.1	66.6	61.3	65.6
France	60.0	61.6	60.3	61.6
Germany	63.3	65.0	63.2	65.0

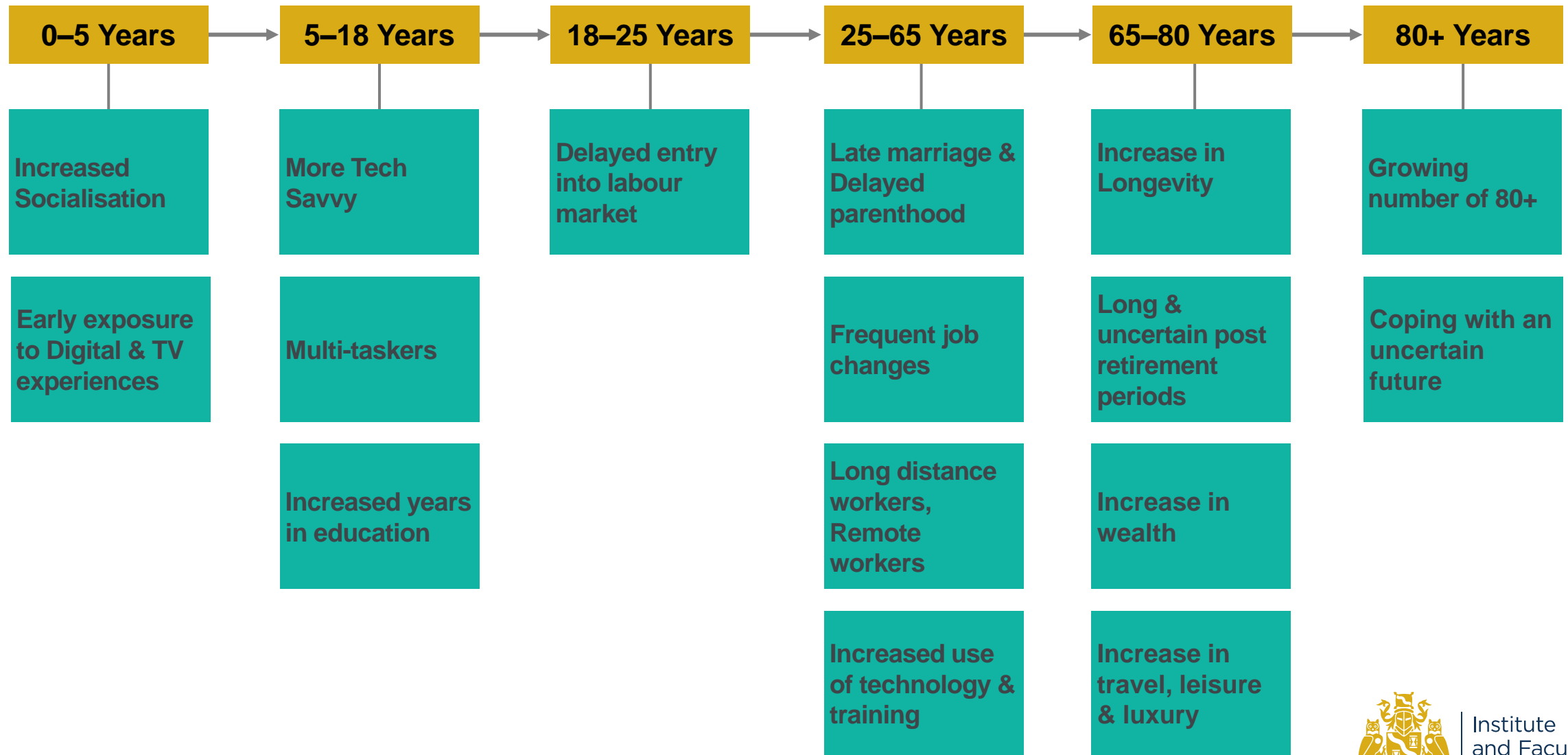
Red Cells: Effective retirement age > Official retirement age

Source: OECD, SSGA Demographics



Institute
and Faculty
of Actuaries

Changing Life Cycles in a Changing World



Source: Longer Lives, Changing Life Cycles: Exploring Consumer & Worker Implications, Credit Suisse (2011)



Institute
and Faculty
of Actuaries

How Increasing Longevity Affects us All?

Individuals & Families	<ul style="list-style-type: none">• Challenge existing asset & time allocation frameworks & intergenerational dynamics
Governments & Societies	<ul style="list-style-type: none">• Policy changes in labour, education, health, pensions & social benefits necessary
Asset managers, pension funds, insurance cos., banks, SWFs etc.	<ul style="list-style-type: none">• Re-assess frameworks & assumptions. Develop new solutions for clients & new approaches to understanding longevity.

Significant change in thinking and mind-set needed

Source: IPE Pension Awards Speech (2013)



Institute
and Faculty
of Actuaries

Demographic Components of GDP Growth

Working-age Population Growth

working-age population = population aged 15–64

Labour Productivity Growth

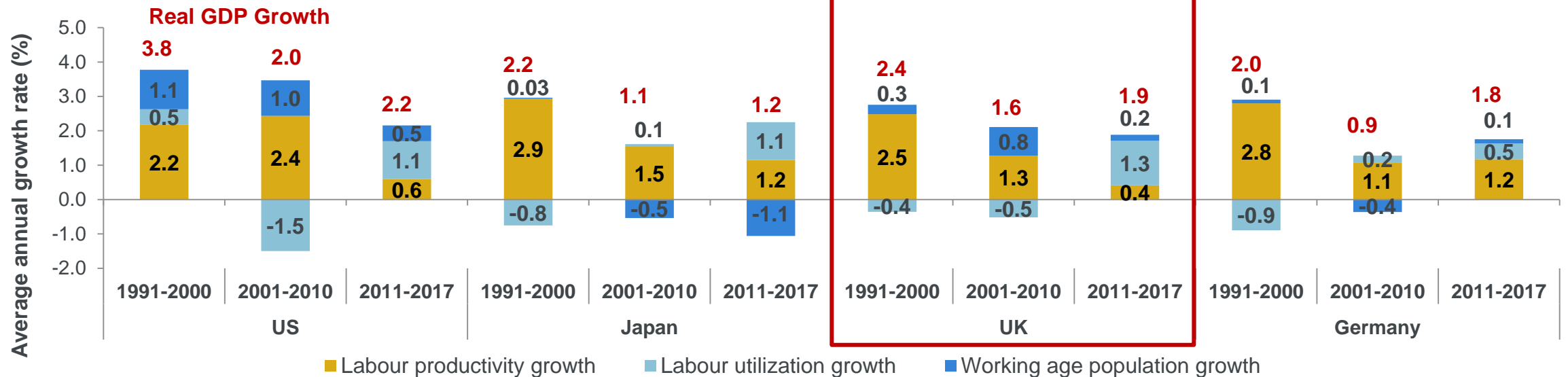
labour productivity = real GDP/hours worked

Labour Utilisation Growth

labour utilisation = hours worked/working-age population

G6 GDP growth rate has fallen dramatically. Main cause is **declining labour productivity growth**.

GDP growth decomposition



Source: SSGA Demographics, GGDC, UN



Institute
and Faculty
of Actuaries

GDP Structure: Advanced Countries

National Income Identity (expenditures method): $C + G + I + (X - M) \equiv \text{GDP}$

C = Consumption, I = Investment, G = Government, X = Exports, M = Imports

GDP Breakdown (% of GDP)

	Netherlands		Belgium		UK	
	1980	2015	1980	2015	1980	2015
Household Consumption	52.2	44.6	55.3	51.2	64.3	65.0
Government Consumption	23.0	25.3	22.7	23.9	20.8	19.4
Gross Capital Formation	23.7	19.3	26.6	23.2	20.2	17.6
Exports	50.8	82.5	49.6	82.9	26.0	27.2
Imports	49.6	71.7	52.7	81.3	23.9	29.3
	Germany		US		Japan	
	1980	2015	1980	2015	1980	2015
Household Consumption	59.2	53.9	61.3	68.1	53	56.6
Government Consumption	20.7	19.2	15.9	14.4	14.4	19.9
Gross Capital Formation	27.0	19.2	23.3	20.3	33.8	23.9
Exports	18.7	46.8	9.8	12.6	13.4	17.6
Imports	23.3	39.2	10.3	15.4	14.6	18

Openness of an economy is measured by the sum of exports + imports as a ratio of GDP:

154% (Netherlands), 164% (Belgium), 56% (UK), 86% (Germany), 36% (Japan), 28% (US)

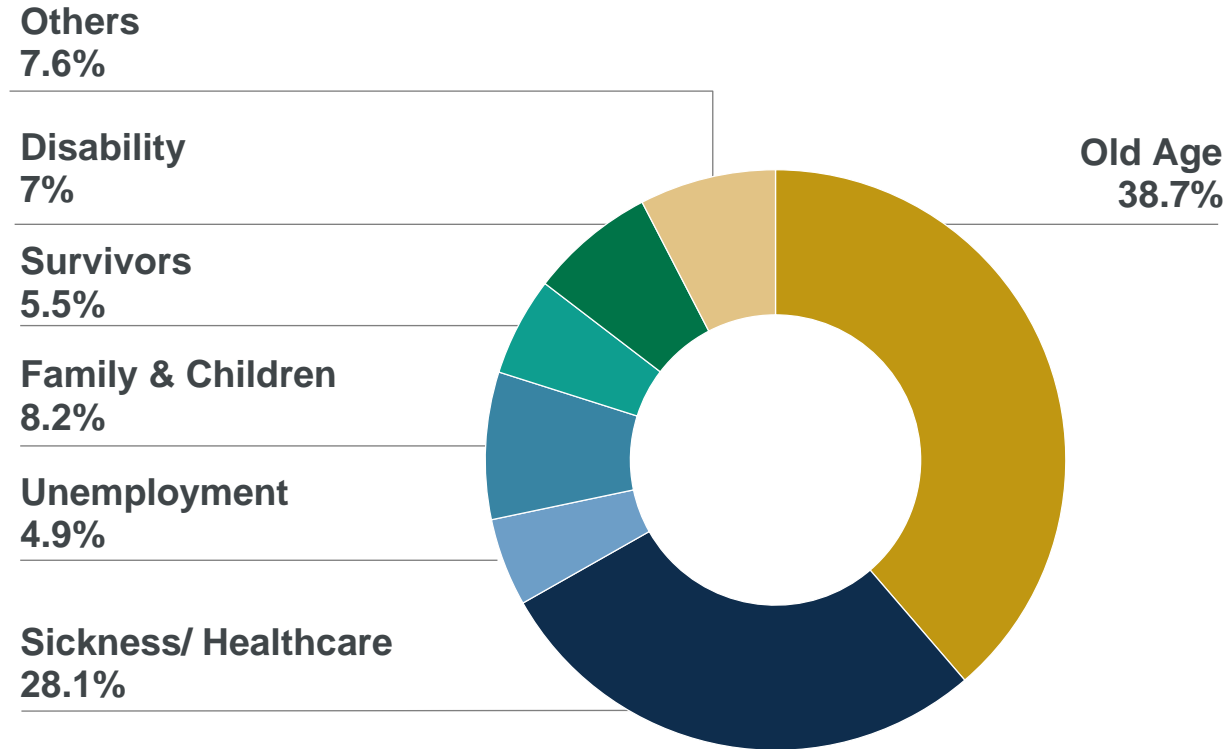
Source: World Bank, SSGA Demographics



Institute
and Faculty
of Actuaries

Unsustainable Fiscal Strains (Ageing Related)

EU28, 2014, % of total benefits



- In most EU countries, age related expenditures currently account for 20% + of GDP
- This is **unsustainable currently and in future** without radical reform

Source: EC, SSGA Demographics



Institute
and Faculty
of Actuaries

EC Projections for Pensions, Health & LT Care: 2016–70

Country	Change 2016–70	2016	2020	2030	2040	2050	2060	2070
Public pensions, gross as % of GDP								
Germany	2.4	10.1	10.3	11.5	12.0	12.2	12.5	12.5
France	-3.3	15.0	15.0	15.4	15.1	13.8	12.5	11.8
Italy	-1.7	15.6	15.6	17.2	18.7	17.3	15.1	13.9
UK	1.7	7.7	7.7	8.0	8.6	8.3	8.9	9.5
EU28	-0.2	11.2	11.1	11.6	12.0	11.7	11.3	11.0
Health care spending as % of GDP — Baseline scenario								
Germany	0.7	7.4	7.5	7.7	8.0	8.2	8.1	8.1
France	0.5	7.9	8.0	8.2	8.4	8.4	8.4	8.3
Italy	0.7	6.3	6.2	6.5	6.9	7.2	7.1	7.0
UK	1.4	7.9	8.1	8.4	8.8	9.1	9.2	9.4
EU28	0.9	6.8	6.9	7.2	7.4	7.6	7.7	7.7
Long-term care spending as % of GDP — Baseline scenario								
Germany	0.6	1.3	1.5	1.7	1.8	2.0	2.0	1.9
France	0.6	1.7	1.8	1.9	2.3	2.4	2.4	2.4
Italy	1.2	1.7	1.8	2.0	2.3	2.8	3.1	3.0
UK	1.3	1.5	1.6	1.8	2.1	2.4	2.6	2.8
EU28	1.2	1.6	1.7	1.9	2.2	2.5	2.7	2.7

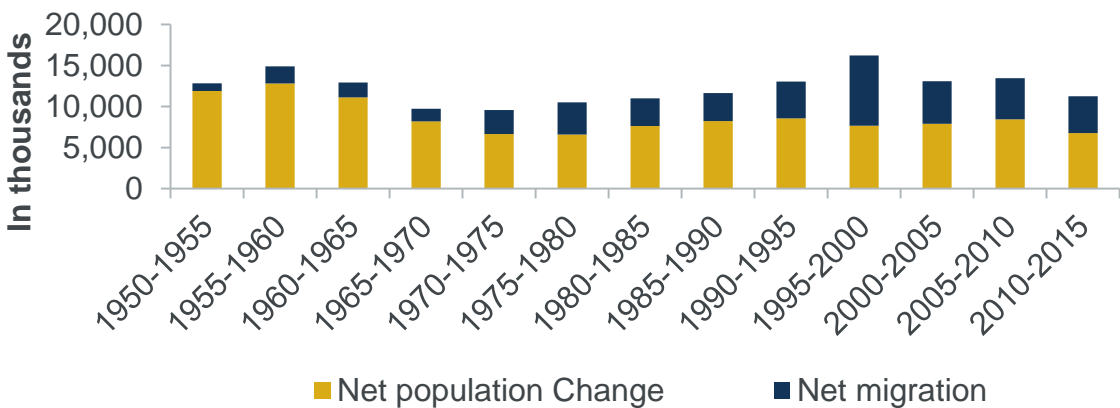
Source: EC Ageing Report, SSGA Demographics



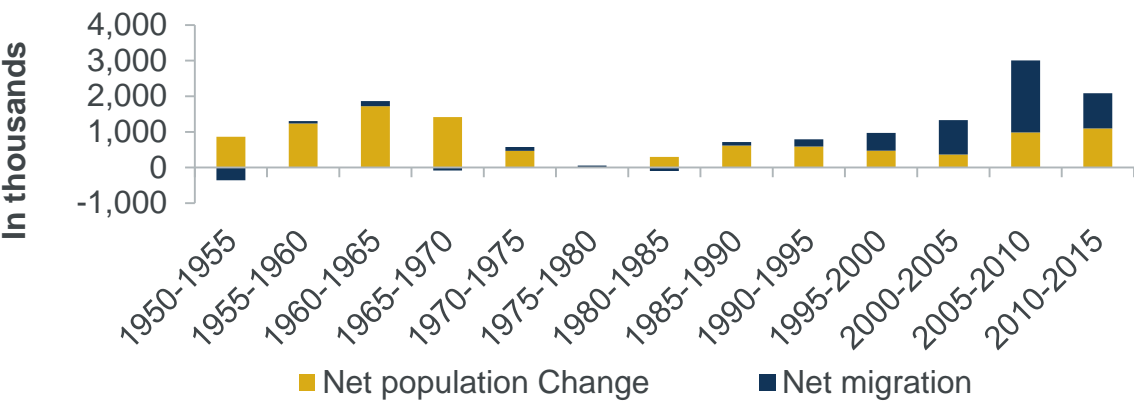
Institute
and Faculty
of Actuaries

Decomposition of Population Change

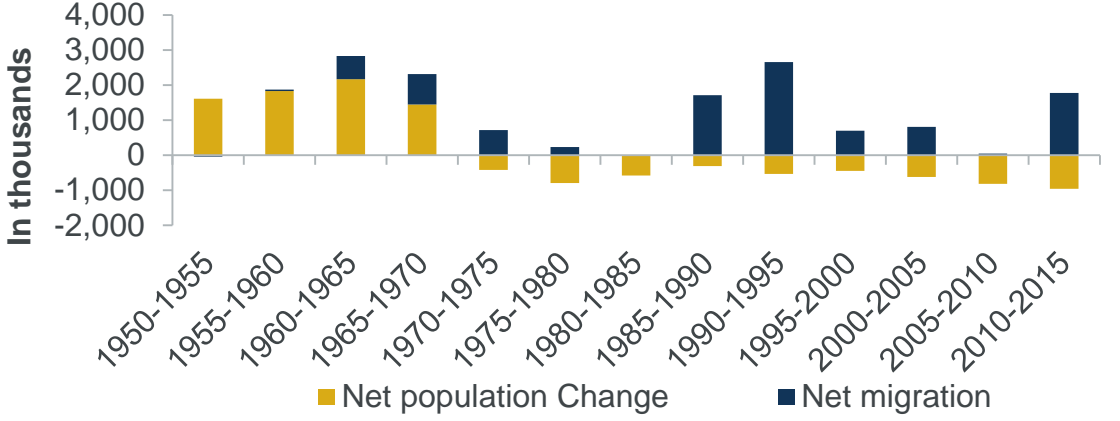
US



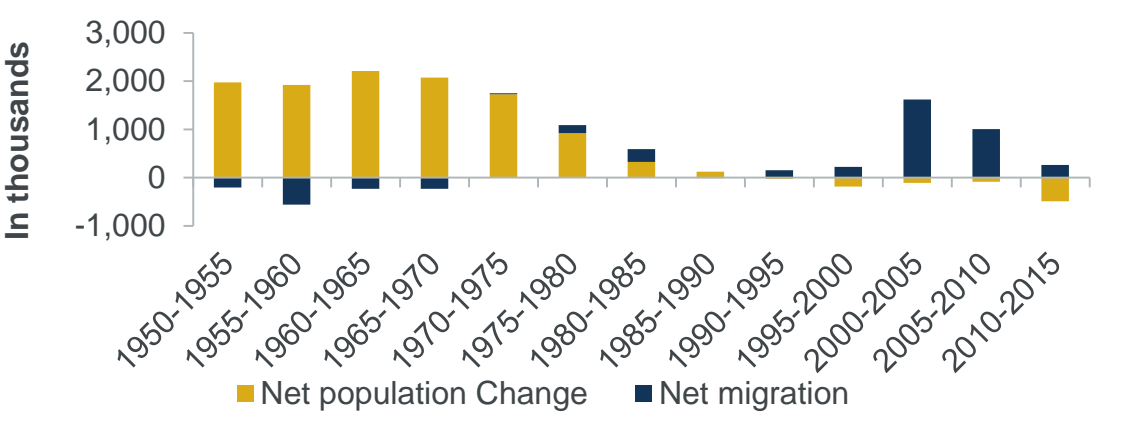
UK



Germany



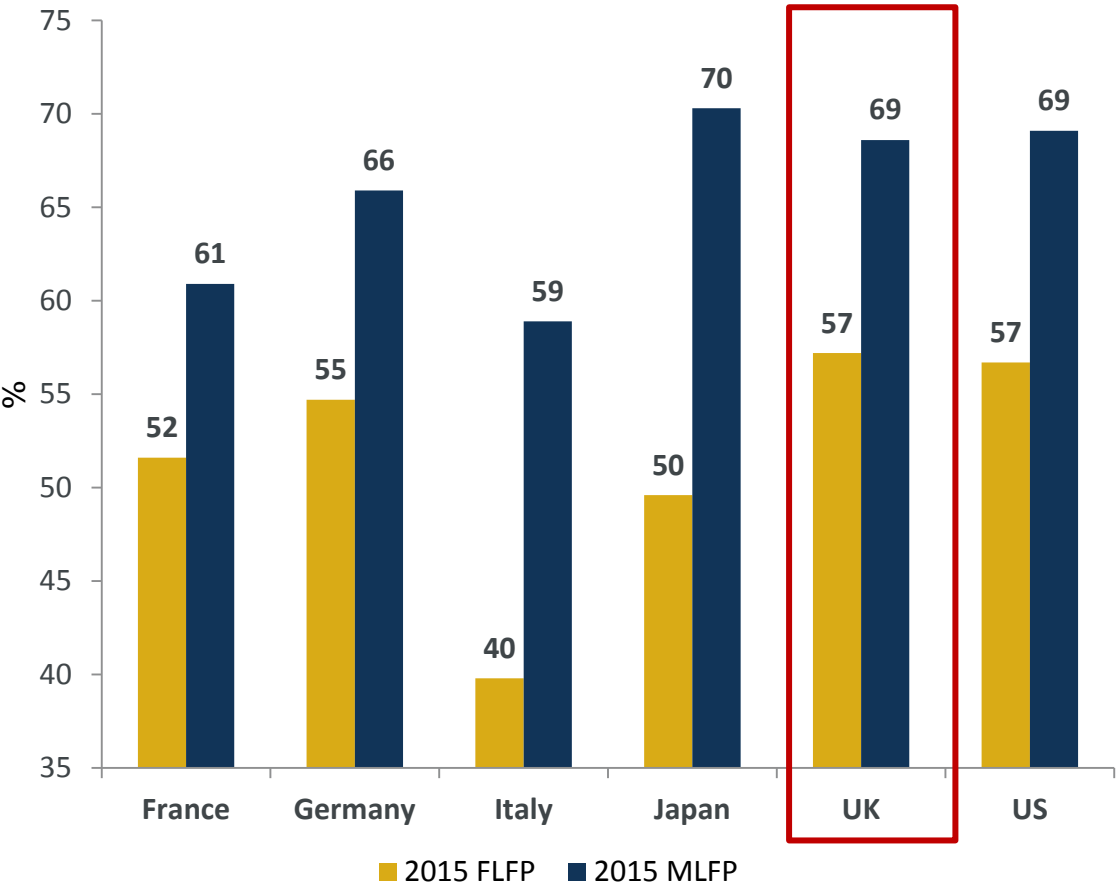
Italy



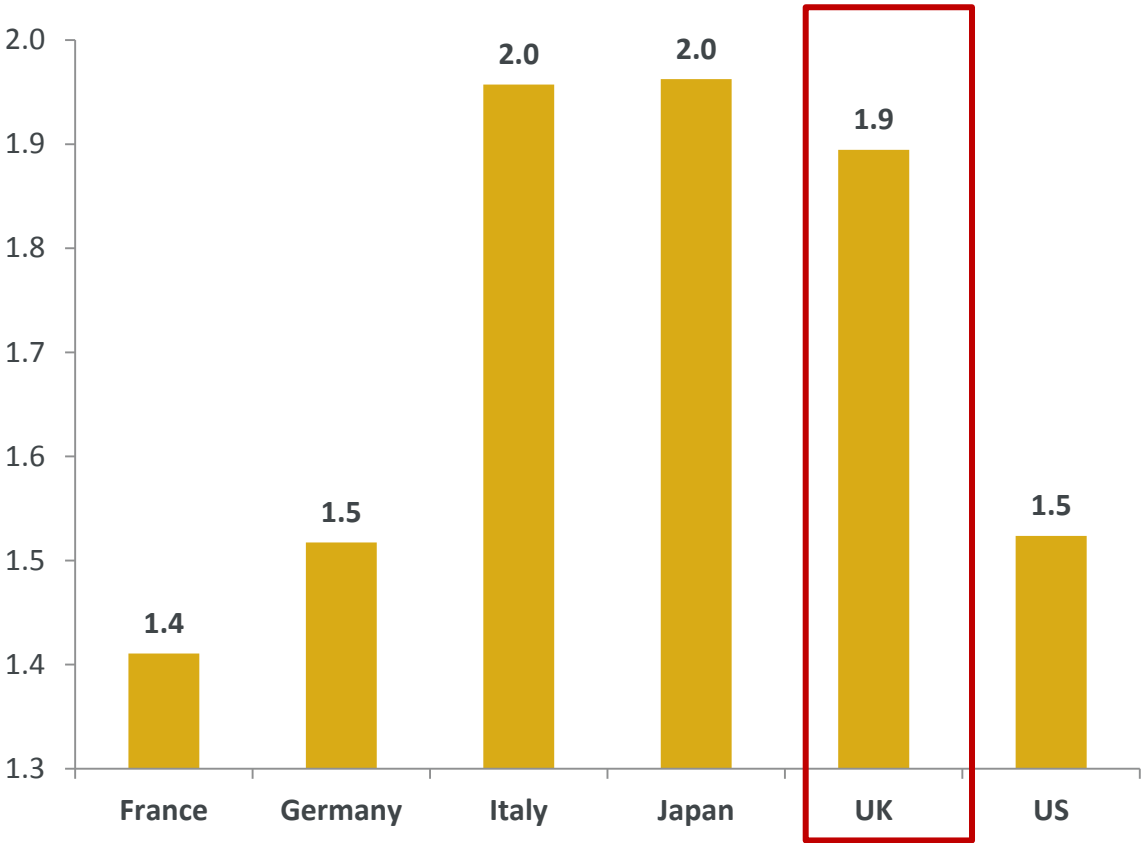
Source: UN, SSGA Demographics

Gender Differences: Participation & Income

Gender Labour Participation Differences

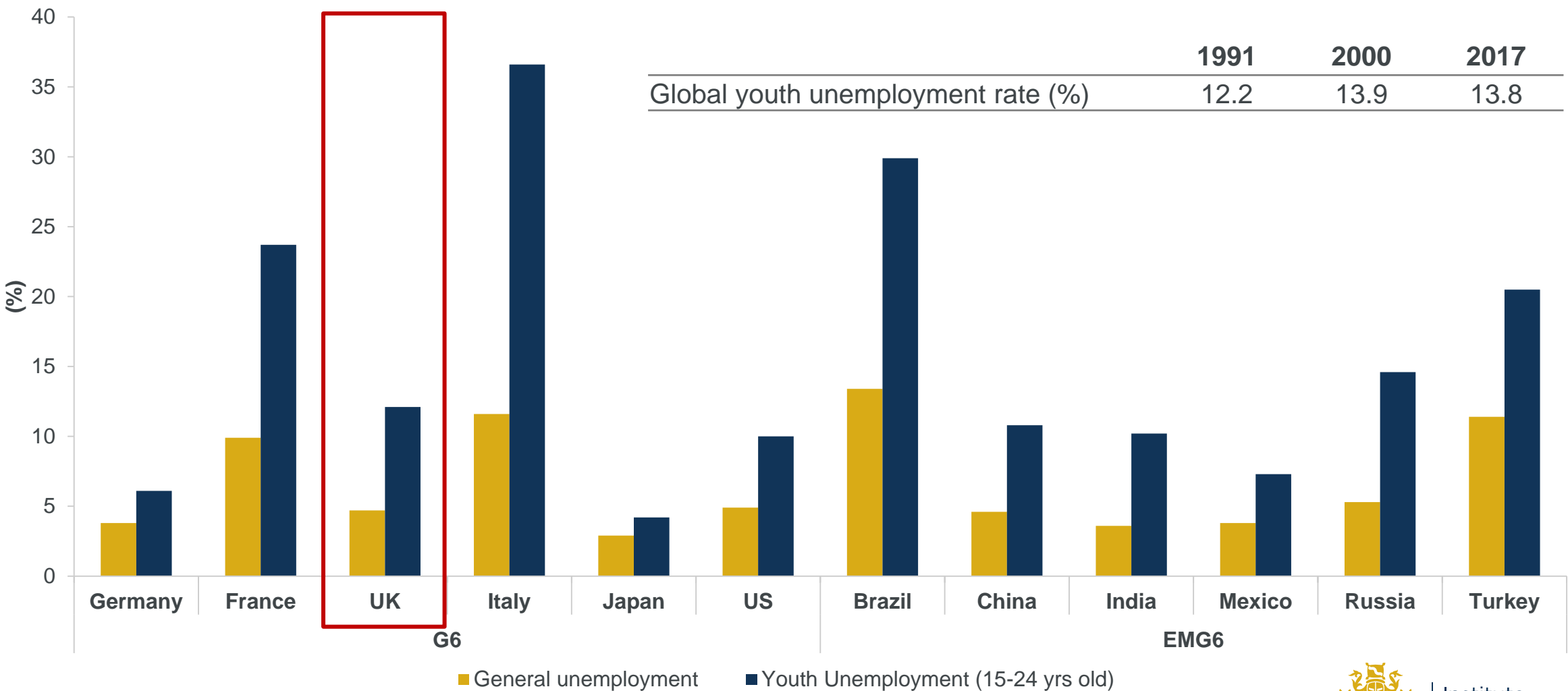


Ratio of Male GNI per capita to female GNI per capita 2015 in 2011 PPP



Source: ILO, UN, SSGA Demographics

Rising Youth Unemployment



Source: ILO, World Bank, SSGA Demographics

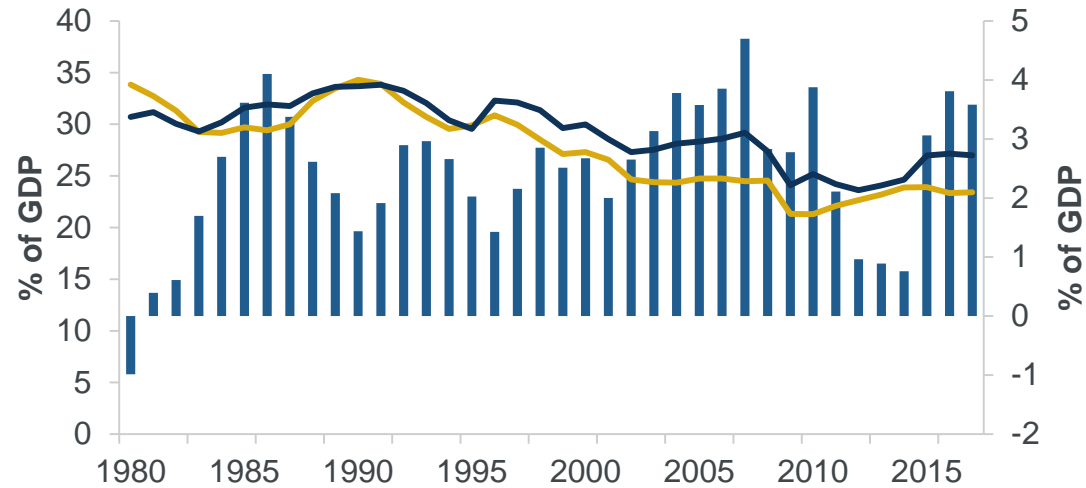
Demographics, Savings & Current Account

From National Income Identity: $S = I + CA + (G - T)$

S = Private Saving, I = Investment, G = Government Expenditure, CA = X – M = Net Exports, T= Taxes

We find statistically strong links between **demographic variables** & aggregate saving, investment & **current account balance**

Japan

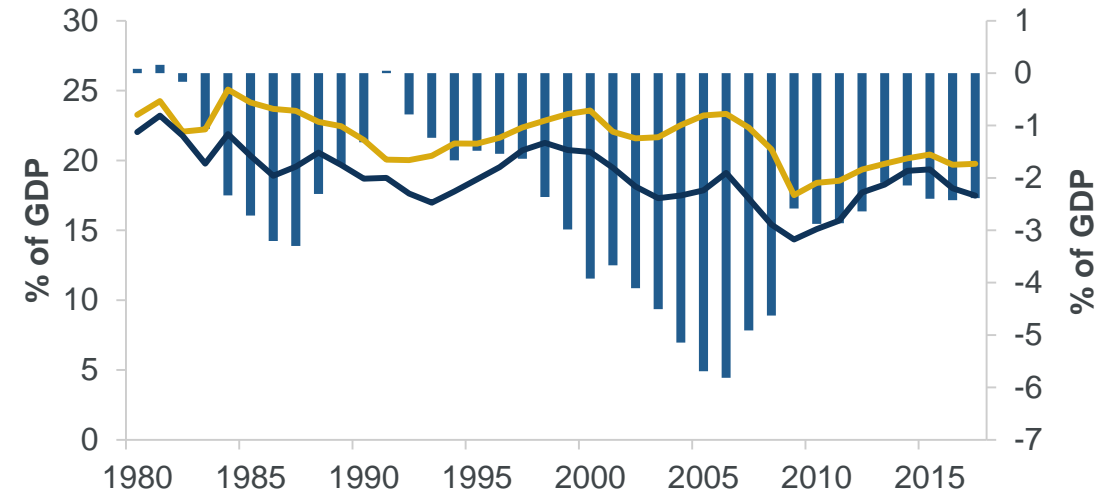


■ Current account balance (RHS)

— Total investment (LHS)

— Gross national savings (LHS)

US



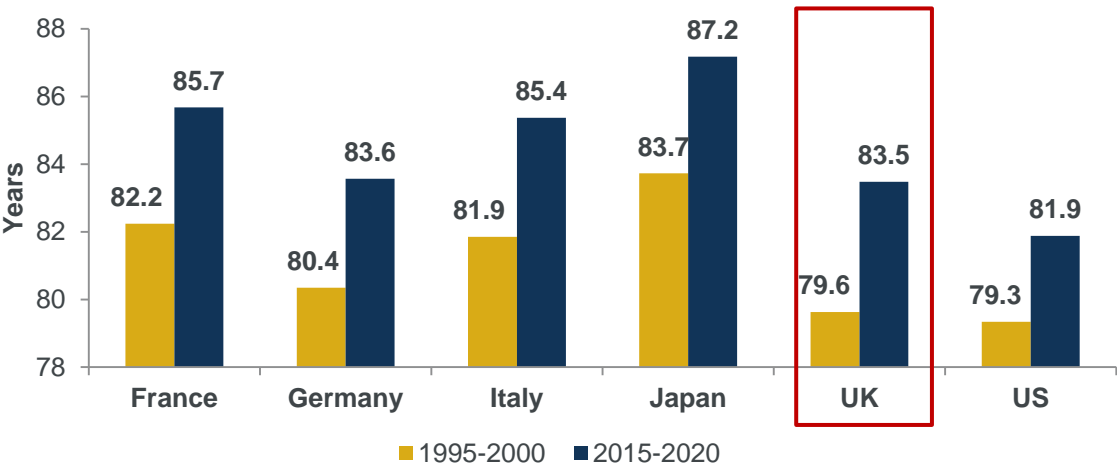
Source: IMF, SSGA Demographics



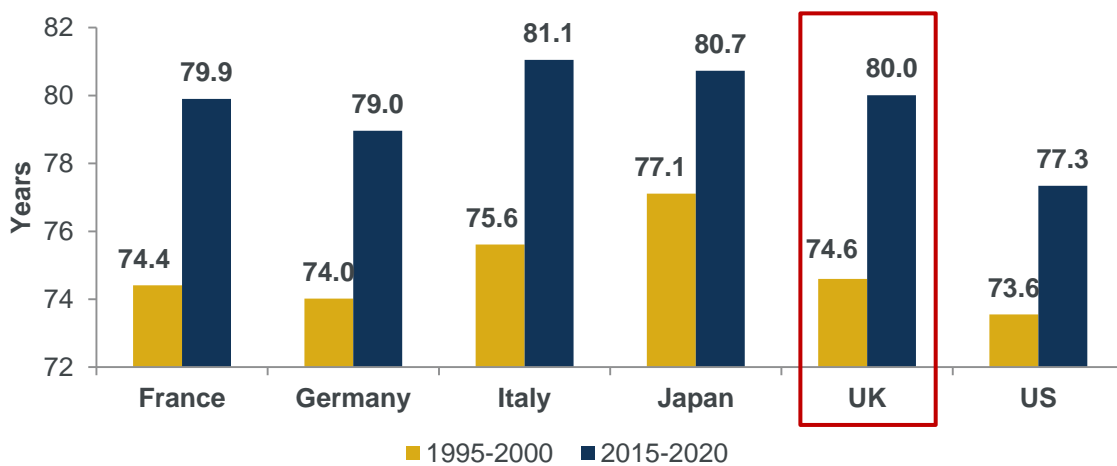
Institute
and Faculty
of Actuaries

Life Expectancy at Birth and at Age 60

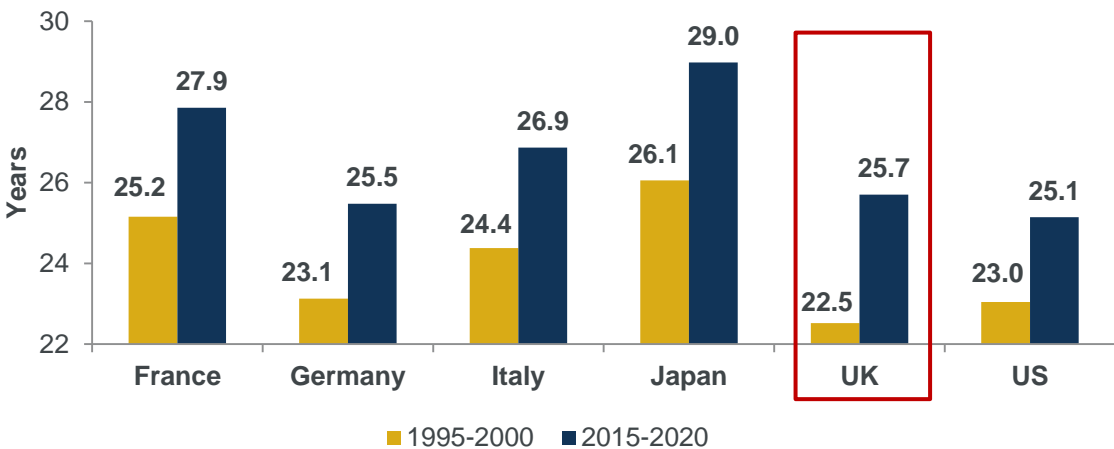
Female Life Expectancy at Birth



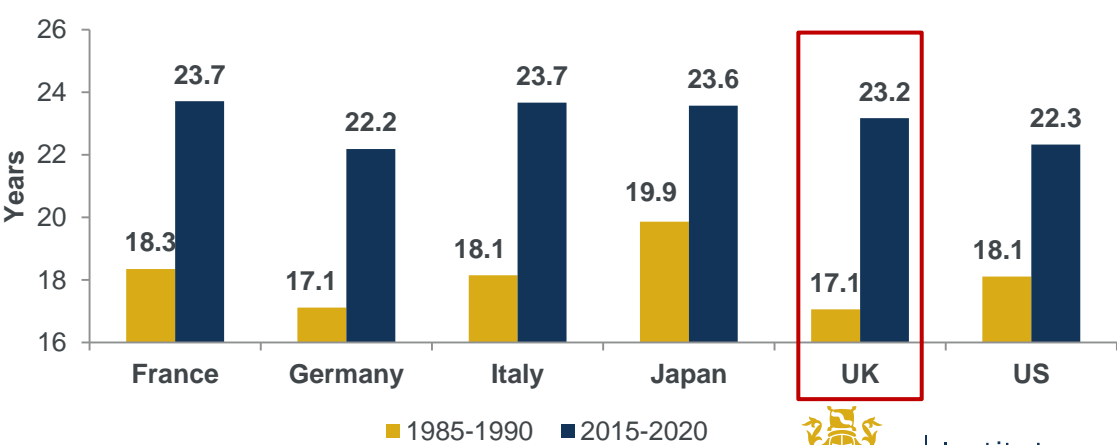
Male Life Expectancy at Birth



Female Life Expectancy at Age 60



Male Life Expectancy at Age 60

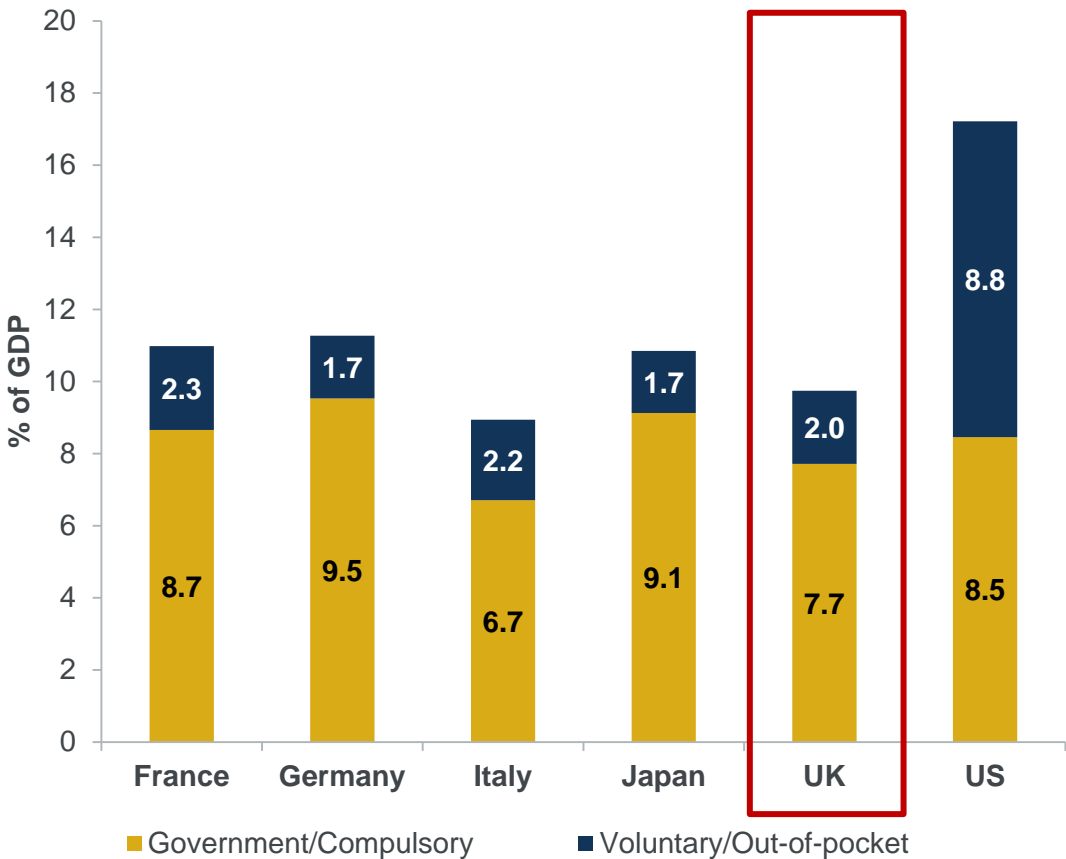


Source: UN, SSGA Demographics

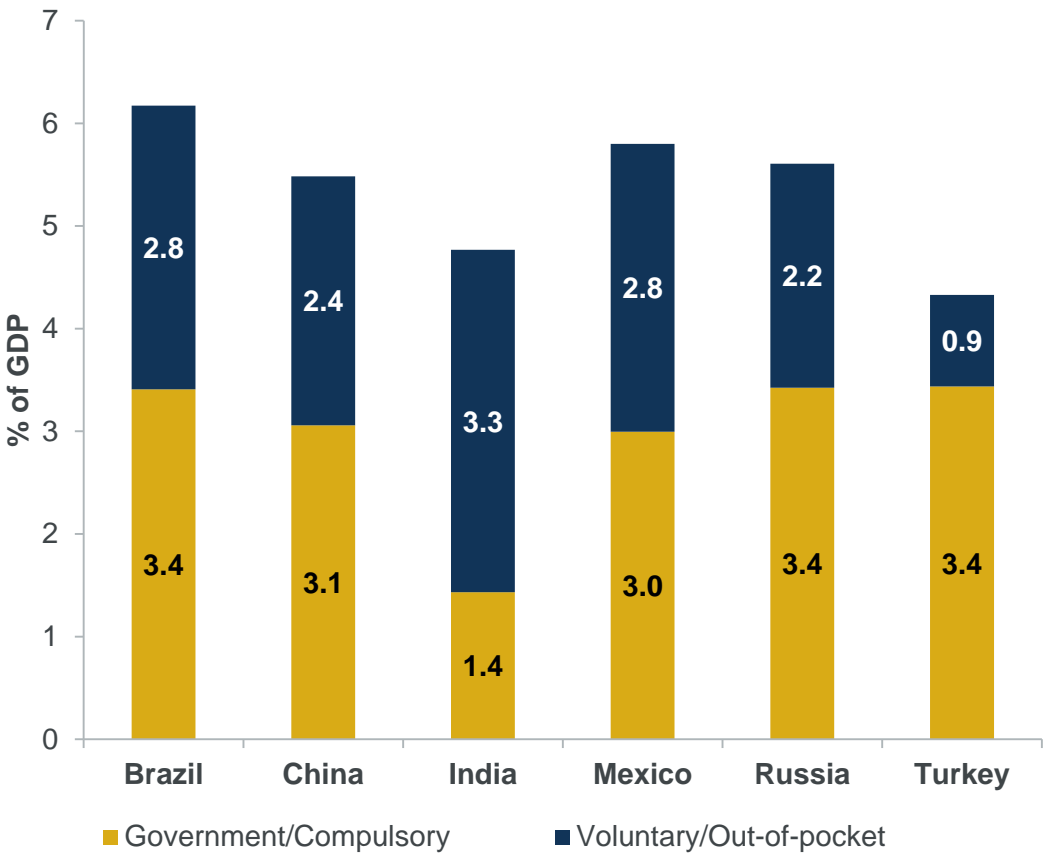


Health Expenditures

G6 Health Expenditures as % of GDP, 2016



EMG6 Health Expenditure as % of GDP, 2016 or nearest year



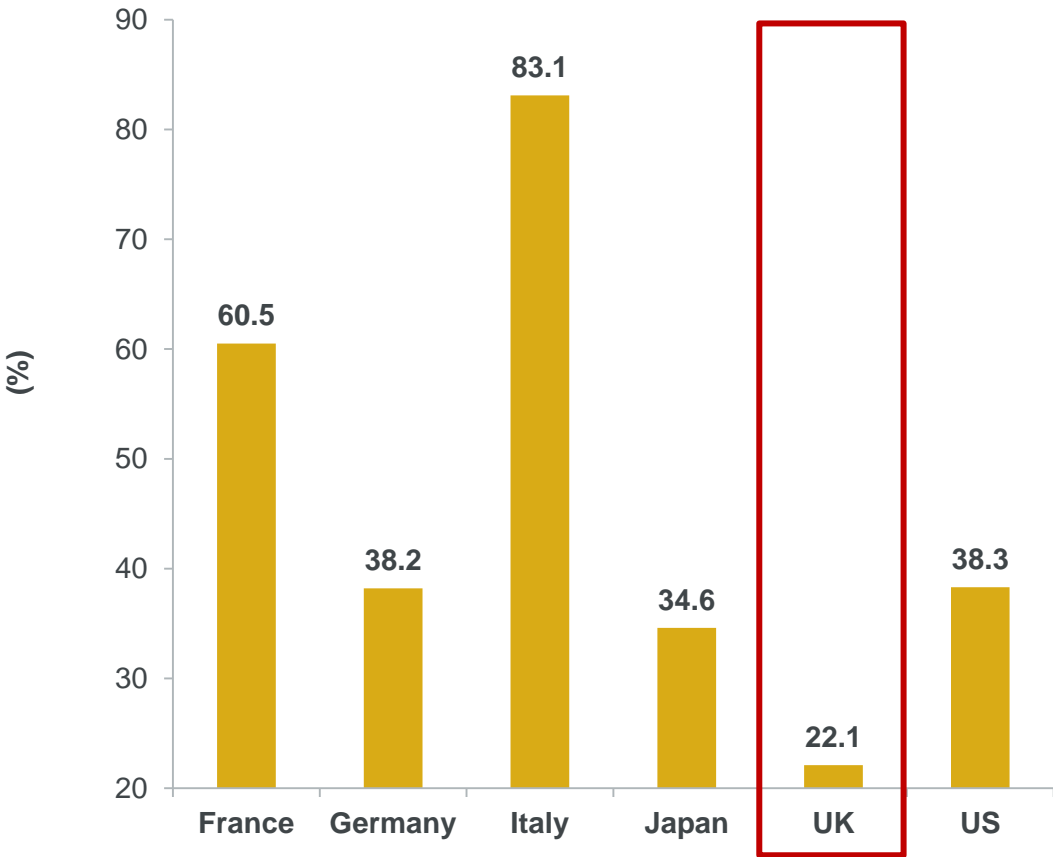
Source: OECD, SSGA Demographics

Brazil data relates to 2013. Russia data relates to 2015. China and India's data relates to 2014.

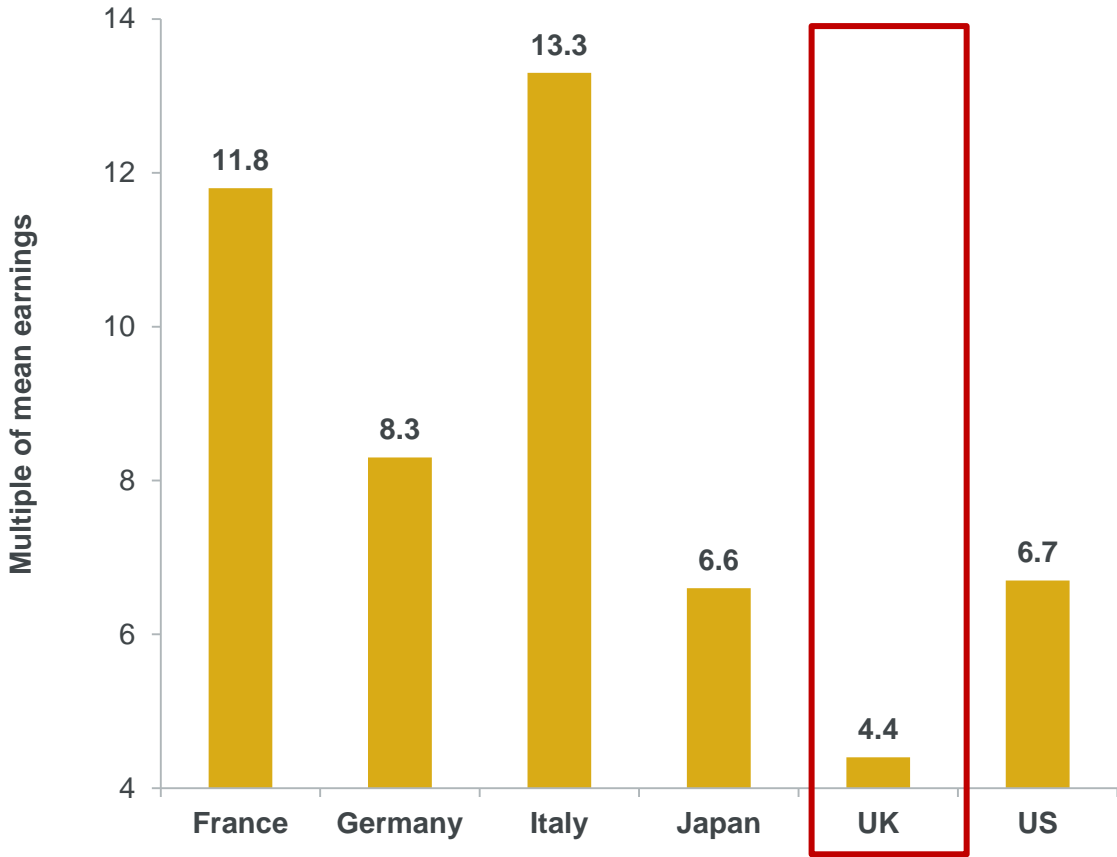


Pension Indicators, Average Male Earners (2016)

G6: Gross pension replacement rates



G6: Gross pension wealth



Source: OECD, SSGA Demographics

Demographics & Monetary Policy

My view since 2005

Effects of Interest Rates:

The **young**: Long on human capital & short on assets

The **old**: Long on assets & short on human capital

Monetary policy impact is different based on **relative fractions of young & old**

Credit Restrictions

The more people in the latter parts of their working lives and in retirement and the fewer the young workers — the less important are credit constraints



Institute
and Faculty
of Actuaries

Demographics & Asset Pricing Fundamentals

Research has shown demographics to affect the following which are fundamentals of asset prices.

- GDP growth
- Inflation
- Sovereign Spreads
- Sovereign Ratings
- Long-term interest rates
- Equity premia
- Credit spreads
- Real Estate

Therefore it is essential to understand the dynamics of both behaviour and fundamentals in asset allocation.



Institute
and Faculty
of Actuaries

Sectors Demographically Advantaged

Changing consumers and workers in a global and technologically advancing world.
Not just people numbers, but groups and behaviours impact these sectors.

INFRASTRUCTURE

NATURAL RESOURCES

LEISURE & LUXURY

EMERGING MARKETS

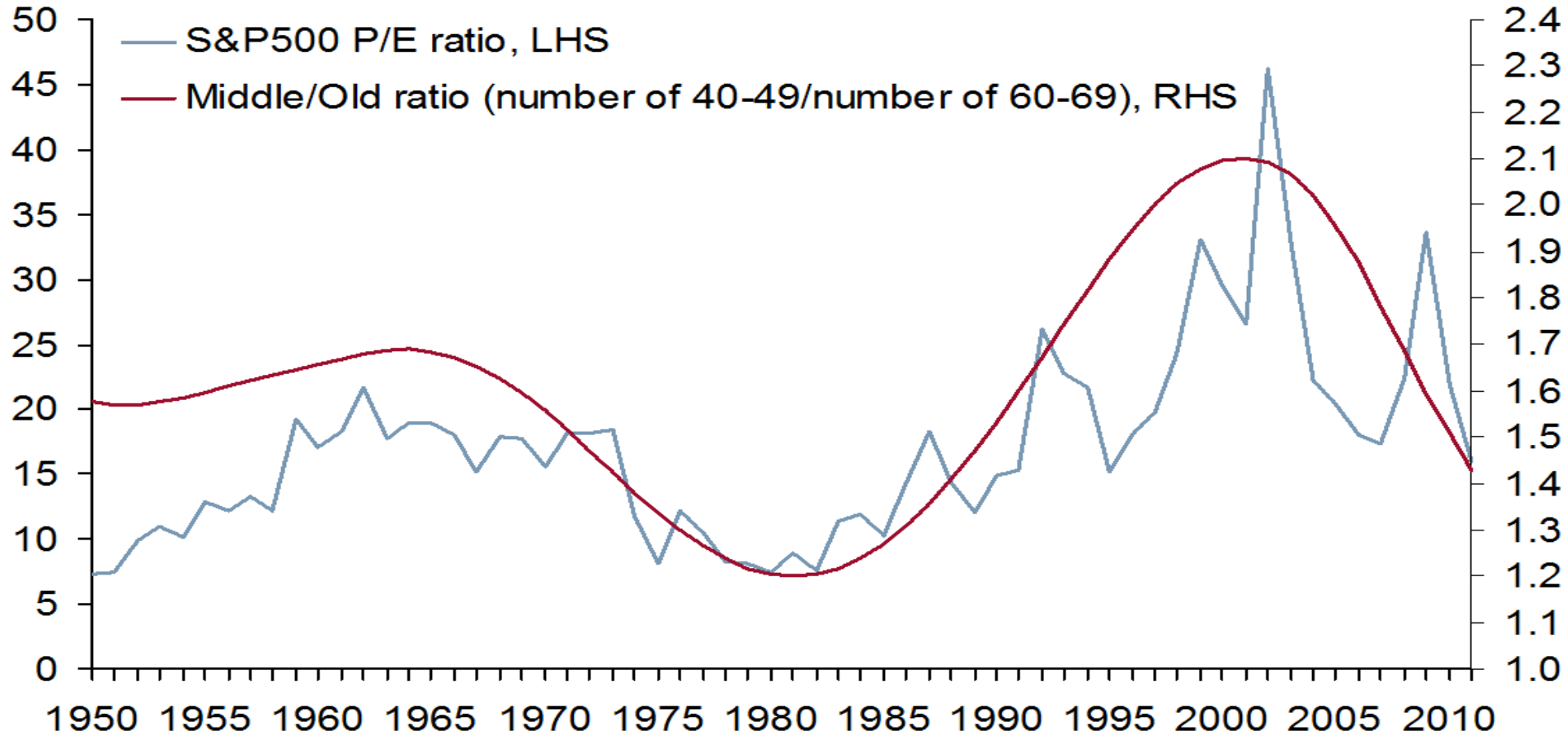
PHARMA & *BIOTECH*

FINANCIAL SERVICES



Institute
and Faculty
of Actuaries

Misapplication of Demographics? US: S&P 500 P/E Ratio and Middle/Old Ratio



Weak correlation for France, Germany and Japan when this framework is applied.

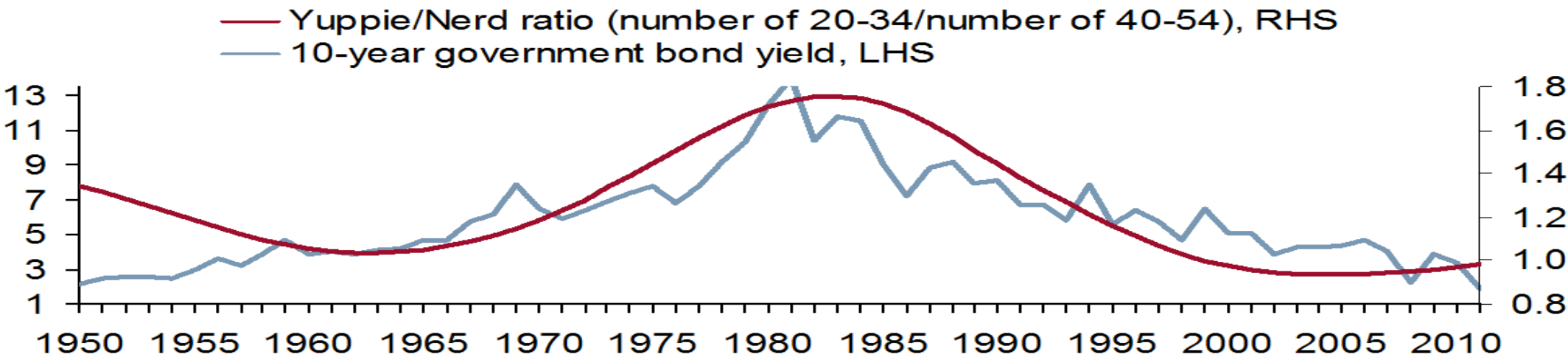
Source: UN, Online Data Robert Shiller, CS



Institute
and Faculty
of Actuaries

Demographics & Interest Rates

US: Yuppie/Nerd ratio & nominal 10-year government bond yield



Correlation between Yuppie/Nerd ratio & nominal 10-year government bond yield

	US	UK	Japan	France	Germany
Time period	1950–2011	1958–2011	1972–2011	1950–2011	1950–2011
Correlation	0.8	0.81	0.57	0.83	0.69

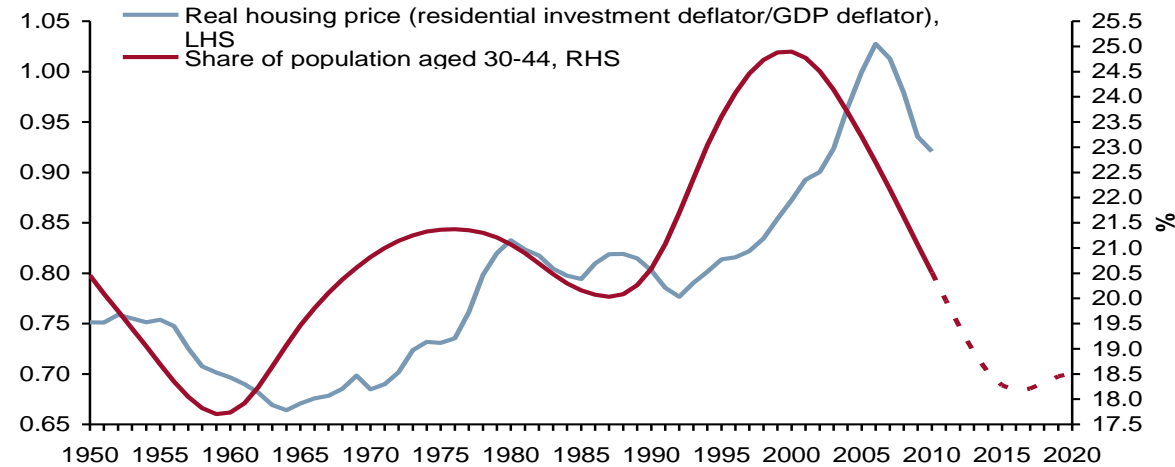
Source: Global Financial Data, UN, CS
Past performance is not a guarantee of future results.



Institute
and Faculty
of Actuaries

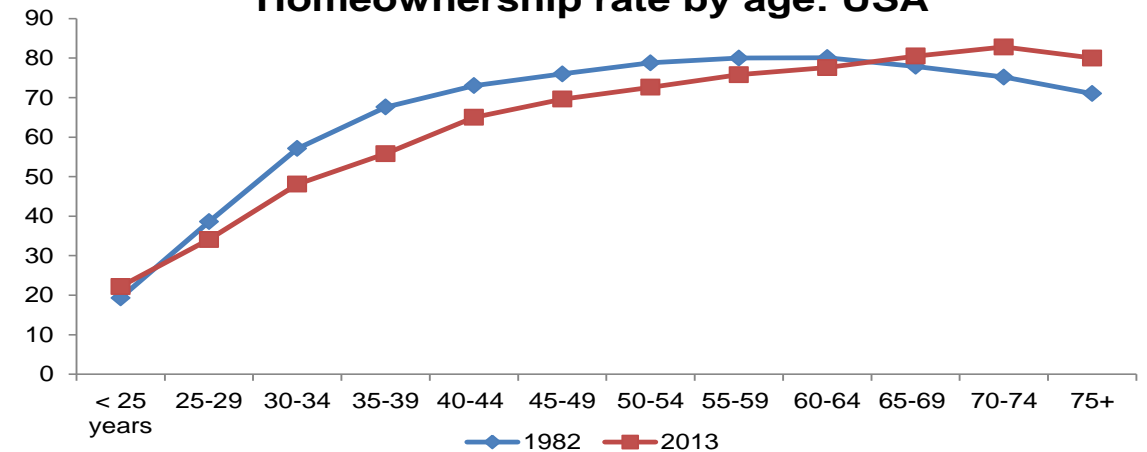
Housing & Population Share (30–44 years)

Real housing price & share of population aged 30–44, US



Real housing price is the residential investment deflator divided by the GDP deflator

Homeownership rate by age: USA



Source: Bureau of Economic Analysis, US Census Bureau UN, CS



Institute
and Faculty
of Actuaries

Population Density & Water/Sanitation Access

(%) of Population with Access to Improved Sanitation Facilities

	Rural		Urban	
	1990	2015	1990	2015
Brazil	31.0	51.5	79.1	88.0
China	40.2	63.7	67.8	86.6
India	5.6	28.5	49.3	62.6
Mexico	34.5	74.5	78.9	88.0
Russia	58.3	58.7	77.9	77.0
Turkey	63.8	85.5	96.1	98.3

(%) of Population with Access to Improved Water Source

	Rural		Urban	
	1990	2015	1990	2015
Brazil	67.7	87.0	95.8	100.0
China	56.1	93.0	97.0	97.5
India	64.2	92.6	88.9	97.1
Mexico	59.4	92.1	91.5	97.2
Russia	81.6	91.2	97.8	98.9
Turkey	74.7	100.0	94.2	100.0

Population Density (People Per Sq. Km)

	1985	2016
Japan	331.2	348.4
UK	233.7	271.3
France	103.7	122.2
Italy	192.4	206.0
Germany	222.5	236.9
US	26.0	35.3
Canada	2.9	4.0
Brazil	16.2	24.8
China	112.0	146.9
India	262.9	445.4
Mexico	39.8	65.6
Russia	8.8	8.8
Turkey	63.8	103.3

Source: World Bank, SSGA Demographics



Institute
and Faculty
of Actuaries

Pension Fund Asset Allocation Trends: 2017 versus 2001

	2001				2017			
	Equities (%)	Bonds (%)	Cash (%)	Other (%)	Equities (%)	Bonds (%)	Cash (%)	Other (%)
Australia	62	19	5	14	49	14	15	22
Canada	62	26	2	10	45	31	2	22
Japan	52	46	0	2	30	56	4	10
Netherlands	44	44	11	1	33	50	0	17
Switzerland	36	35	20	9	33	34	4	28
UK	67	18	5	10	47	35	2	16
US	65	28	2	5	50	21	2	28

DB — DC Asset Split (2017 versus 2001)*

	2001		2017	
	DC (%)	DB (%)	DC (%)	DB (%)
Australia	83	17	87	13
Canada	3	97	5	95
Japan	0	100	4	96
Netherlands	2	98	6	94
UK	8	92	19	81
US	52	48	60	40

* DC assets in Switzerland are cash balance plans and are excluded from the analysis



Institute
and Faculty
of Actuaries

Source: Willis Towers Watson (2018)

Factors Influencing Longevity

Robert Fogel (2005): Physiology of aging over life cycles of 3 cohorts:

Civil War cohort (1838–1845): Short lives with common disabilities at young ages, prone to malnutrition and exposed to severe diseases

World War II cohort (1920 and 1930): Fewer died as infants, most lived past age 60 without severe chronic diseases

Cohort born between 1980 and 1990: 50–50 chance of living to age 100

Heterogeneity of longevity depends on:

Social economic status (education, occupation, income level)

Gender, marital status, nutrition

Living environment (climate, pollution, sanitation, population density)

Physiological factors

Life style, diet

Source: R. Fogel (2005), 'Changes in the Physiology of Aging During the Twentieth Century', NBER Working paper 11233



Institute
and Faculty
of Actuaries

An “Asset Allocation Puzzle”

Advisor and Investor Type	% of Portfolio			Ratio of Bonds to Stocks
	Cash	Bonds	Stocks	
Fidelity				
Conservative	50	30	20	1.5
Moderate	20	40	40	1
Aggressive	5	30	65	0.46
Merrill Lynch				
Conservative	20	35	45	0.78
Moderate	5	40	55	0.73
Aggressive	5	20	75	0.27
Jane Bryant Quinn				
Conservative	50	30	20	1.5
Moderate	10	40	50	0.8
Aggressive	0	0	100	0
New York Times				
Conservative	20	40	40	1
Moderate	10	30	60	0.5
Aggressive	0	20	80	0.25

In a 1997 study, 4 financial advisors provided asset allocation recommendations for different types of investors — conservative, moderate and aggressive

Their advice on the ratio of bonds to stocks varied with investor-type. This is contrary to Markowitz and was considered a puzzle by the authors

Source: Mankiw et al (1997)



Institute
and Faculty
of Actuaries

Development, Governance, Corruption & Gender Balance Indicators

Countries	Human Development Index Score (%)	Human Development Index Rank	Gender Gap Index Score (%)	Gender Gap Index Rank	Corruption Perception Index Score	Corruption Perception Index Rank	Sustainability	Percentile Rank
Norway	94.9	1	83.0	2	85	6	1.17	91.4
Switzerland	93.9	2	75.5	21	86	5	1.32	95.7
Germany	92.6	4	77.8	12	81	10	0.76	71.0
Netherlands	92.4	7	73.7	32	83	8	0.89	77.6
Iceland	92.1	9	87.8	1	78	14	1.33	96.2
US	92.0	10	71.8	49	74	18	0.35	58.6
Canada	92.0	10	76.9	16	82	9	1.24	93.3
Sweden	91.3	14	81.6	5	88	4	0.98	82.4
UK	91.0	16	77.0	15	81	10	0.38	59.0
Japan	90.3	17	65.7	114	72	20	1.01	86.2
France	89.7	21	77.8	11	69	23	-0.06	44.3
Finland	89.5	23	82.3	3	89	3	0.96	81.0
Italy	88.7	26	69.2	82	47	60	0.35	58.1
Saudi Arabia	84.7	38	58.4	138	46	62	-0.50	28.6
UAE	84.0	42	64.9	120	66	24	0.44	61.0
Russia	80.4	49	69.6	71	29	131	-0.89	16.7
Turkey	76.7	71	62.5	131	41	75	-2.00	5.7
Mexico	76.2	77	69.2	81	30	123	-0.77	20.0
Brazil	75.4	79	68.4	90	40	79	-0.45	30.0
China	73.8	90	67.4	100	40	79	-0.52	27.1
India	62.4	131	66.9	108	40	79	-0.95	14.3

Source: WB, WEF, UN, TI, SSGA Demographics



Institute
and Faculty
of Actuaries

Conclusions

Changing behaviour of consumers and workers is rendering many old models invalid.

Understanding of behaviour alongside market and economic factors will be key to good policy.

Macro fundamentals (growth, inflation, public debt) are affected by underlying demographics

Demographics affects equity premia, sovereign spreads, sovereign ratings, term premia and therefore has implications for asset allocation

Pensions strategic asset allocation must holistically take into account the macro drivers of inflation risk, interest rate risk, longevity risk and market risk

The social implications of demographics are now being captured by the Sustainable Development Goals at a macro-policy level and ESG at the micro investments level.



Institute
and Faculty
of Actuaries

Biography



Amlan Roy, PhD

Dr. Amlan Roy is the Global Chief Retirement Strategist and Senior Managing Director at SSGA since April 2017. He is an experienced Global Macro Researcher specializing in Demographics & Pensions related to Economics, Investments and Public Policy. He highlights structural issues related to gender disparity, youth unemployment, system risks due to policy interactions with ALM & SAA. He is a Senior Research Associate at LSE and Guest Finance Professor at LBS.

Prior to joining SSGA, he was Head of Global Demographics & Pensions Research and Managing Director at Credit Suisse having joined there in 1998. At Credit Suisse, Amlan was a client facing Researcher presenting to clients in 25+ countries and speaking at 60+ global conferences/events. In a prior role he developed global risk and asset allocation models serving as an international expert on Financial System Architecture.

His big-picture macro strategic research in Global Demographics & Pensions is used by policy makers and investors and draws on the fields of Macroeconomics, Portfolio Theory, Behavioral Economics, Statistics, Derivatives and Econometrics.

Prior to joining Credit Suisse, he spent over a decade in academia with a distinguished teaching career in the US and the UK. He was UK ESRC Research Fellow, Ponders Fellow a Boston University Doctoral Scholar and a Government of India National Scholar. Amlan has a PhD and an MA in Financial Economics from the University of Iowa, an MBA from Indian Institute of Management Ahmedabad and a BA Honours in Economics from St. Stephen's College, University of Delhi.



Institute
and Faculty
of Actuaries

Contacts.

Global Demographics & Retirement Research

Amlan Roy, PhD

Senior Managing Director

Global Chief Retirement Strategist

+44 203 395 6719

amlan_roy@ssga.com

Amy Le

Investment Strategist

+44 203 395 6590

amy_le@ssga.com



Institute
and Faculty
of Actuaries

Questions

Comments

The views expressed in this presentation are those of invited contributors and not necessarily those of the IFoA. The IFoA do not endorse any of the views stated, nor any claims or representations made in this presentation and accept no responsibility or liability to any person for loss or damage suffered as a consequence of their placing reliance upon any view, claim or representation made in this presentation.

The information and expressions of opinion contained in this publication are not intended to be a comprehensive study, nor to provide actuarial advice or advice of any nature and should not be treated as a substitute for specific advice concerning individual situations. On no account may any part of this presentation] be reproduced without the written permission of the IFoA [or authors, in the case of non-IFoA research].



Institute
and Faculty
of Actuaries

Important Disclosures

United Kingdom: State Street Global Advisors Limited. Authorised and regulated by the Financial Conduct Authority. Registered in England. Registered No. 2509928. VAT No. 5776591 81. Registered office: 20 Churchill Place, Canary Wharf, London, E14 5HJ. Telephone: 020 3395 6000. Facsimile: 020 3395 6350.

This communication is directed at professional clients this includes eligible counterparties as defined by the Financial Conduct Authority (FCA) who are deemed both knowledgeable and experienced in matters relating to investments. The products and services to which this communication relates are only available to such persons and persons of any other description (including retail clients) should not rely on this communication.

Unless otherwise noted, the opinions expressed are those of the author who is a researcher at State Street. Views and opinions are subject to change at any time based on market and other conditions.

All information has been obtained from sources believed to be reliable, but its accuracy is not guaranteed. There is no representation or warranty as to the current accuracy, reliability or completeness of, nor liability for, decisions based on such information.

These statements are based on certain assumptions and analyses made by SSGA in light of its experience and perception of historical trends, current conditions, expected future developments and other factors it believes are appropriate in the circumstances, many of which are detailed herein. Such statements are subject to a number of assumptions, risks, uncertainties, many of which are beyond SSGA's control. Readers are cautioned that any such statements are not guarantees of any future performance and that actual results or developments may differ materially from those projected in the forward-looking statements.

The information provided does not constitute investment advice as such term is defined under the Markets in Financial Instruments Directive (2014/65/EU) and it should not be relied on as such. It should not be considered a solicitation to buy or an offer to sell any investment. It does not take into account any investor's or potential investor's particular investment objectives, strategies, tax status, risk appetite or investment horizon. If you require investment advice you should consult your tax and financial or other professional advisor.

Past performance is no guarantee of future results. Investing involves risk including the risk of loss of principal.

Investing involves risk including the risk of loss of principal.

The whole or any part of this work may not be reproduced, copied or transmitted or any of its contents disclosed to third parties without SSGA's express written consent.



Institute
and Faculty
of Actuaries

Important Disclosures

Equity securities may fluctuate in value in response to the activities of individual companies and general market and economic conditions.

Bonds generally present less short-term risk and volatility than stocks, but contain interest rate risk (as interest rates raise, bond prices usually fall); issuer default risk; issuer credit risk; liquidity risk; and inflation risk. These effects are usually pronounced for longer-term securities. Any fixed income security sold or redeemed prior to maturity may be subject to a substantial gain or loss.

Diversification does not ensure a profit or guarantee against loss.

Asset Allocation is a method of diversification which positions assets among major investment categories. Asset Allocation may be used in an effort to manage risk and enhance returns. It does not, however, guarantee a profit or protect against loss.

Increase in real interest rates can cause the price of inflation-protected debt securities to decrease. Interest payments on inflation-protected debt securities can be unpredictable.

Web: www.ssga.com

© 2018 State Street Corporation — All rights reserved.

Tracking Number: 2149276.1.1.EMEA.INST

Expiration Date: 30 June 2019



Institute
and Faculty
of Actuaries