

# Population Ageing & Financial Stability

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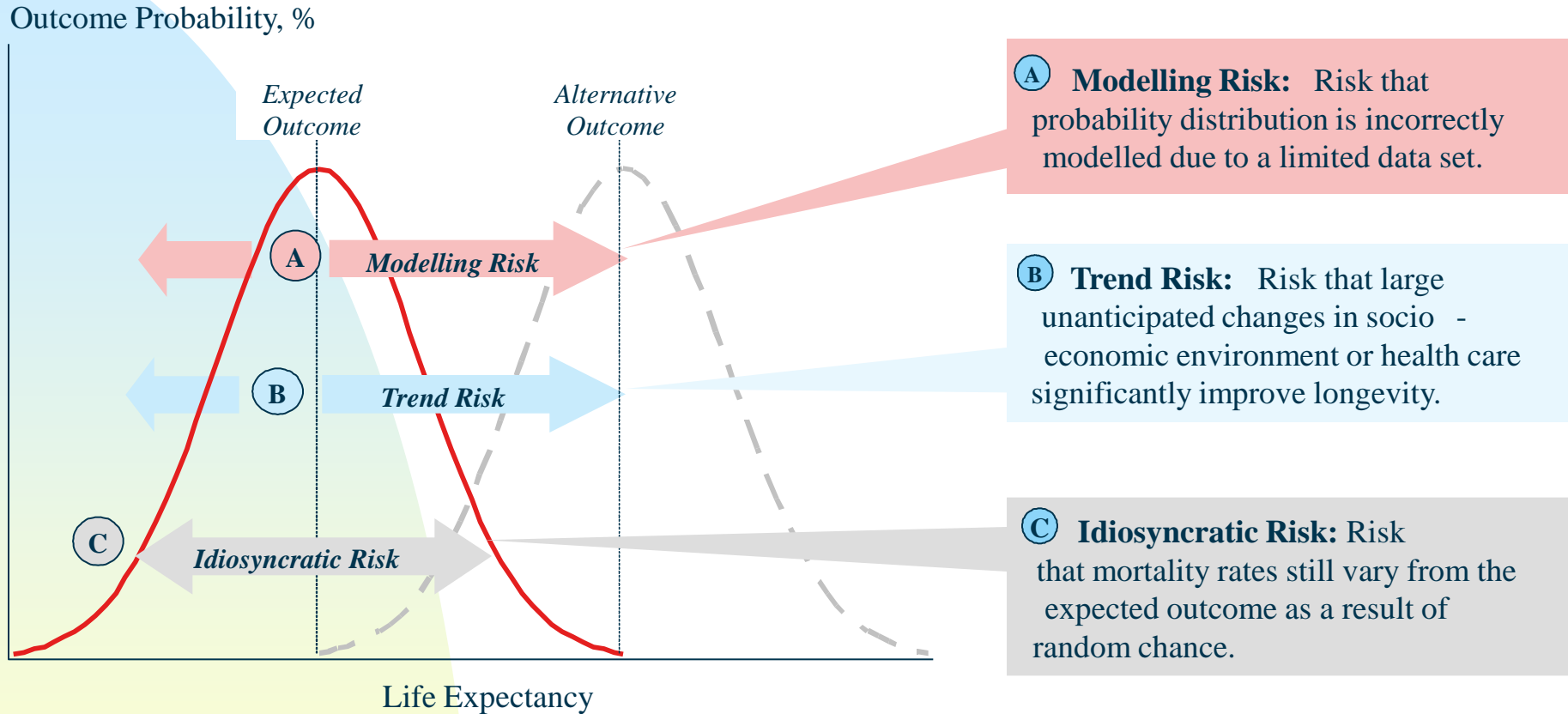
# Agenda

- Longevity risk
- Total support ratio and economic growth
- Population ageing and its consequences
- The financial crisis and population ageing



# Longevity risk

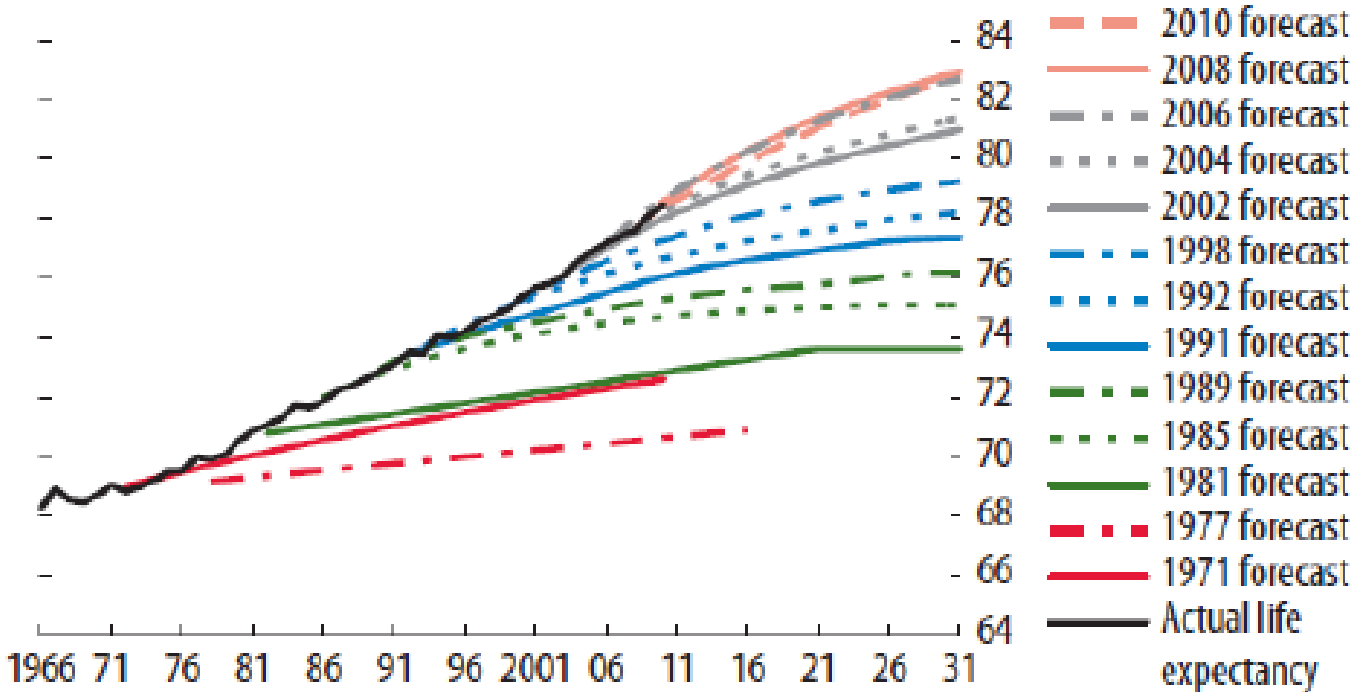
# Longevity risk is driven by three underlying risks



Modelling Risk and Idiosyncratic (Random Variation) Risk are greater the smaller the number of scheme members and the greater the distribution of scheme benefits.

# Official LE projections systematically underestimated

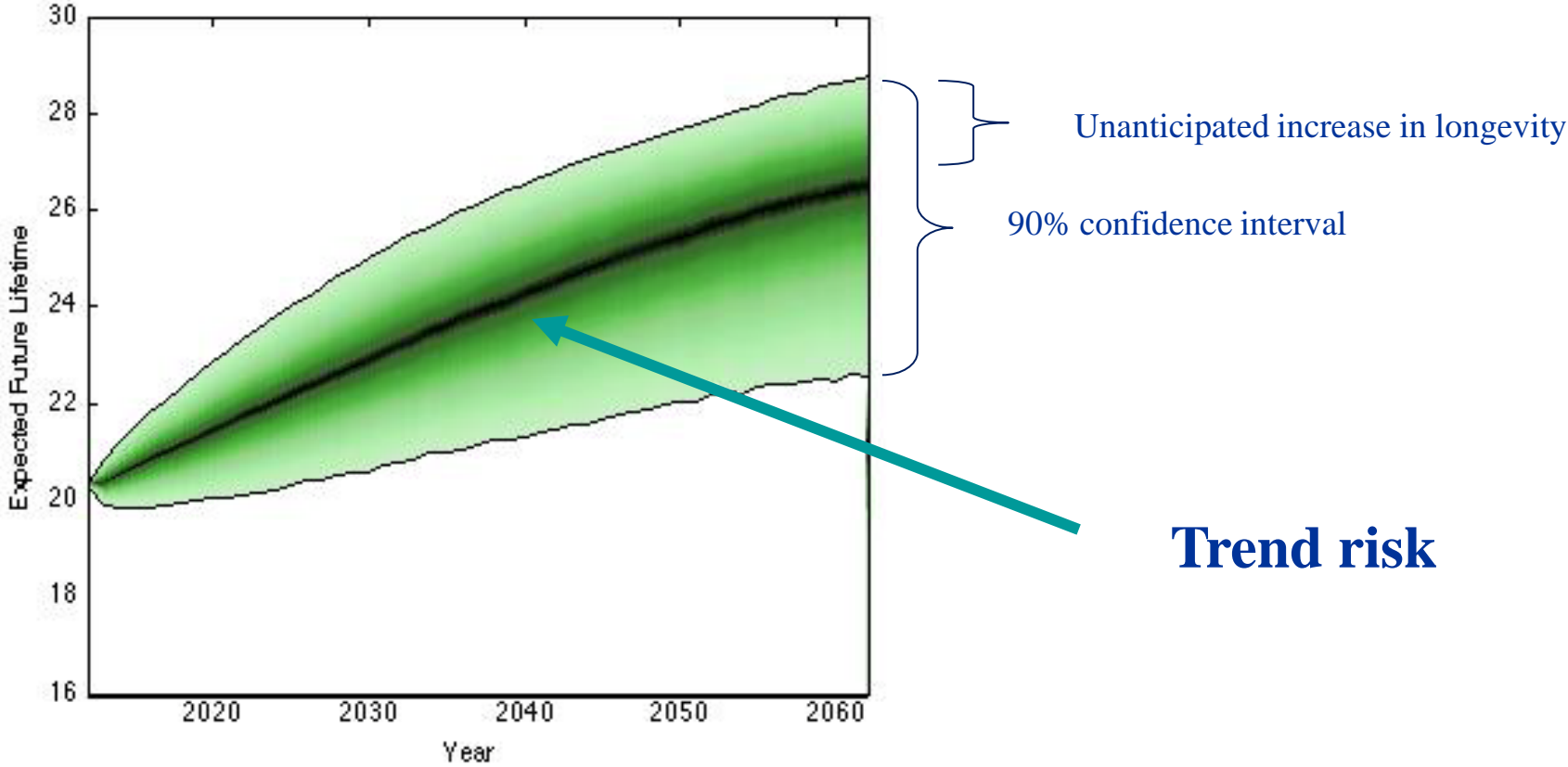
Projected life expectancy at birth, UK males, 1966-2031 (in years)



Source: Office of National Statistics.

# Longevity fan chart for 65-year old males

(Cairns-Blake-Dowd model)





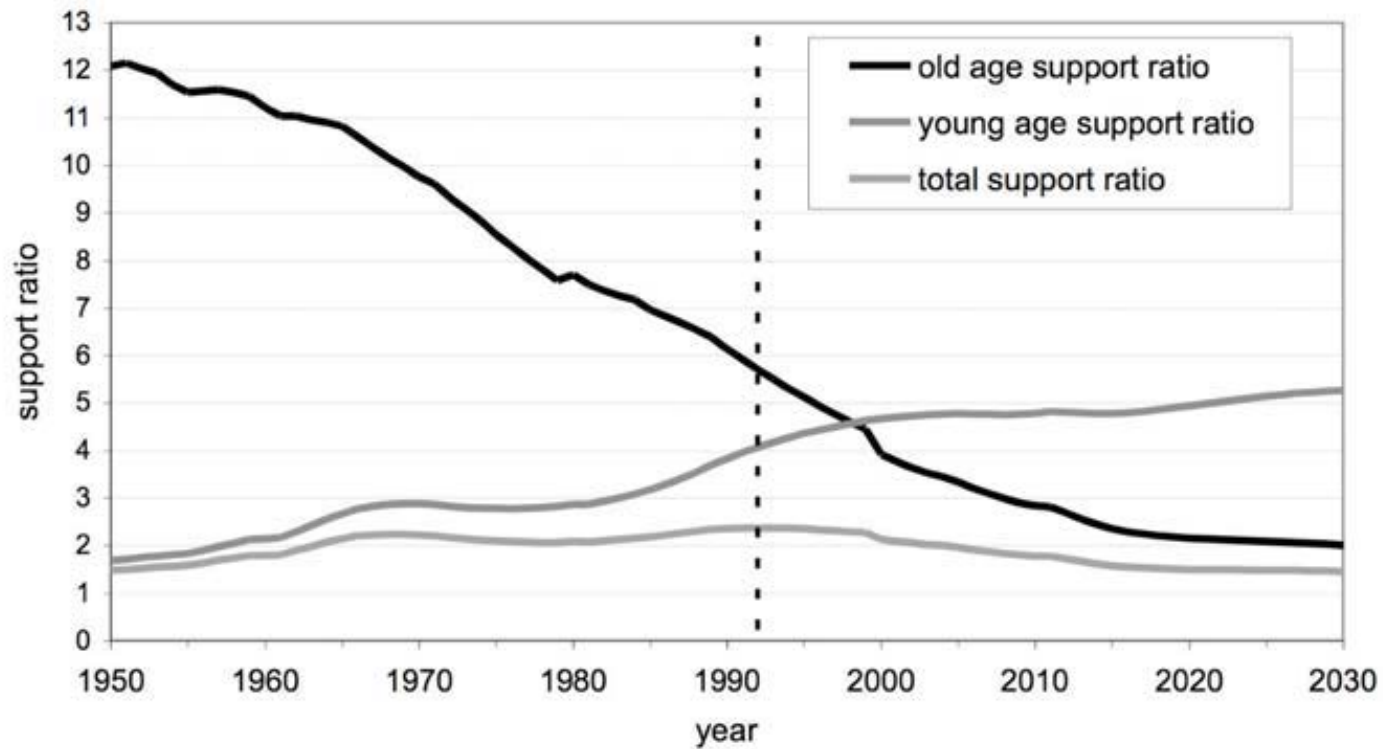
# Total support ratio and economic growth

# Total support ratio (TSR) and economic growth

- Ratio of the number of workers to the number of both young and old people
  - High TSR is typically associated with rapid economic growth
    - Cf China, India and Korea
- In Japan, TSR peaked in 1992 and its economy has been fairly static since
- In UK, TSR peaked in 2007 and is now in decline

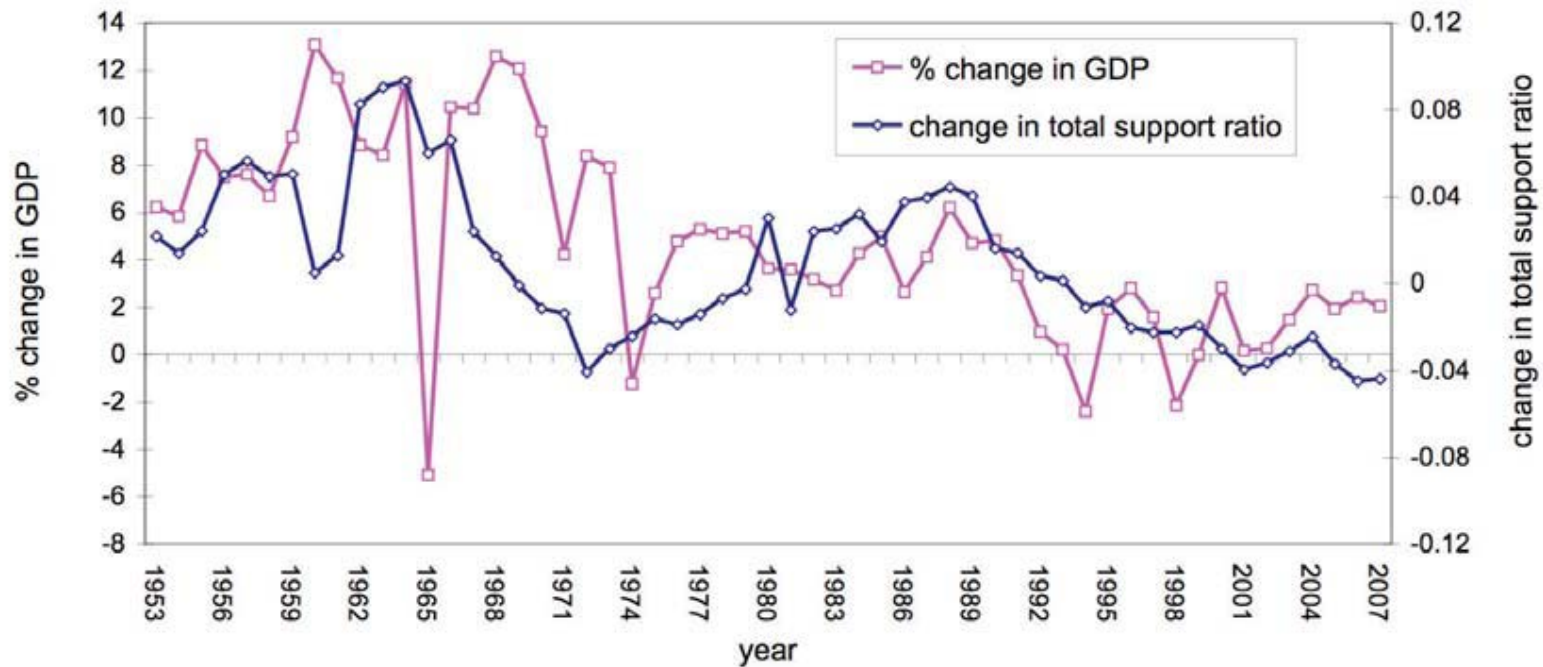


# Support ratios in Japan



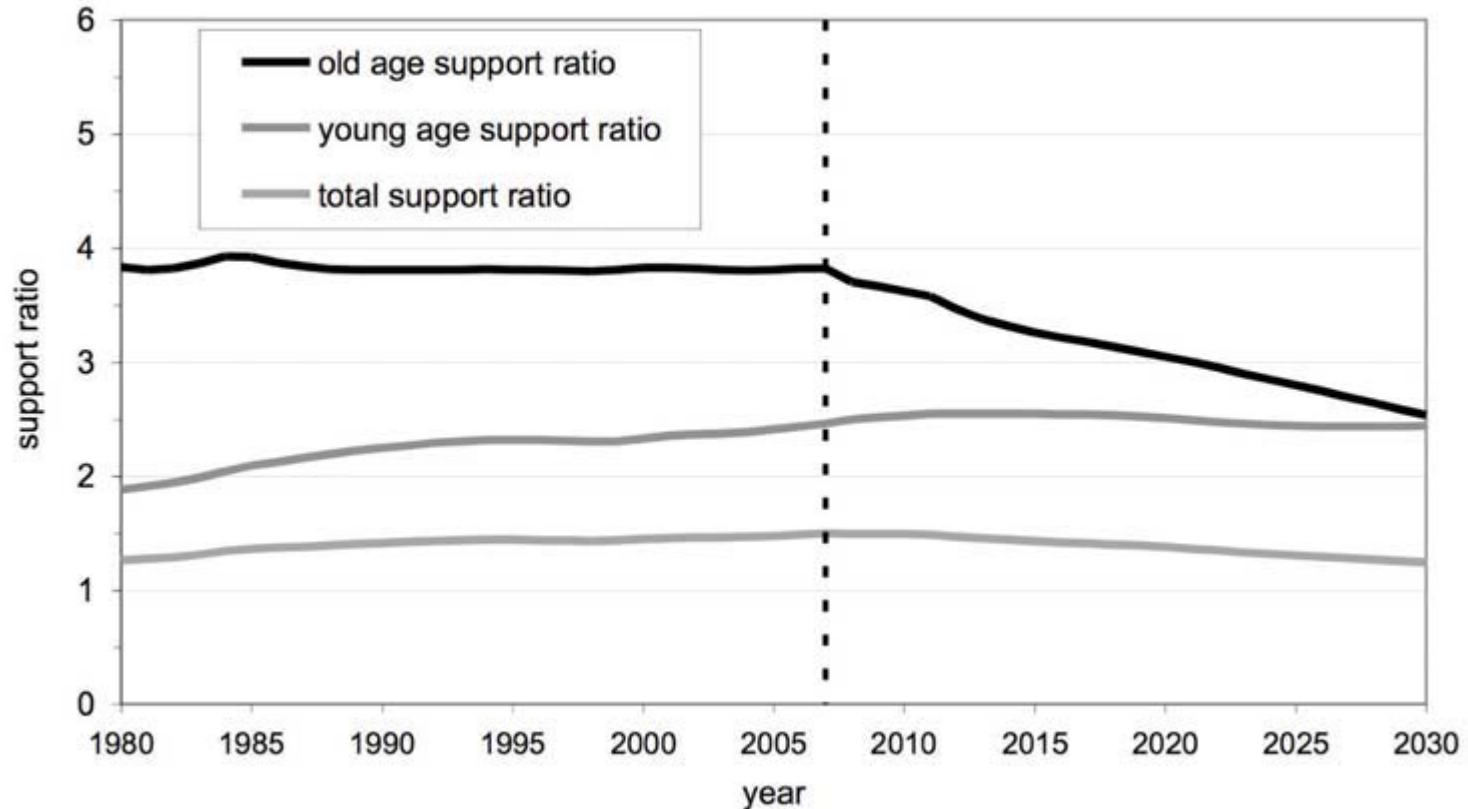
Source: Fig. A2 in Mayhew (2009)

# Relationship between growth rate in GDP and changes in TSR in Japan



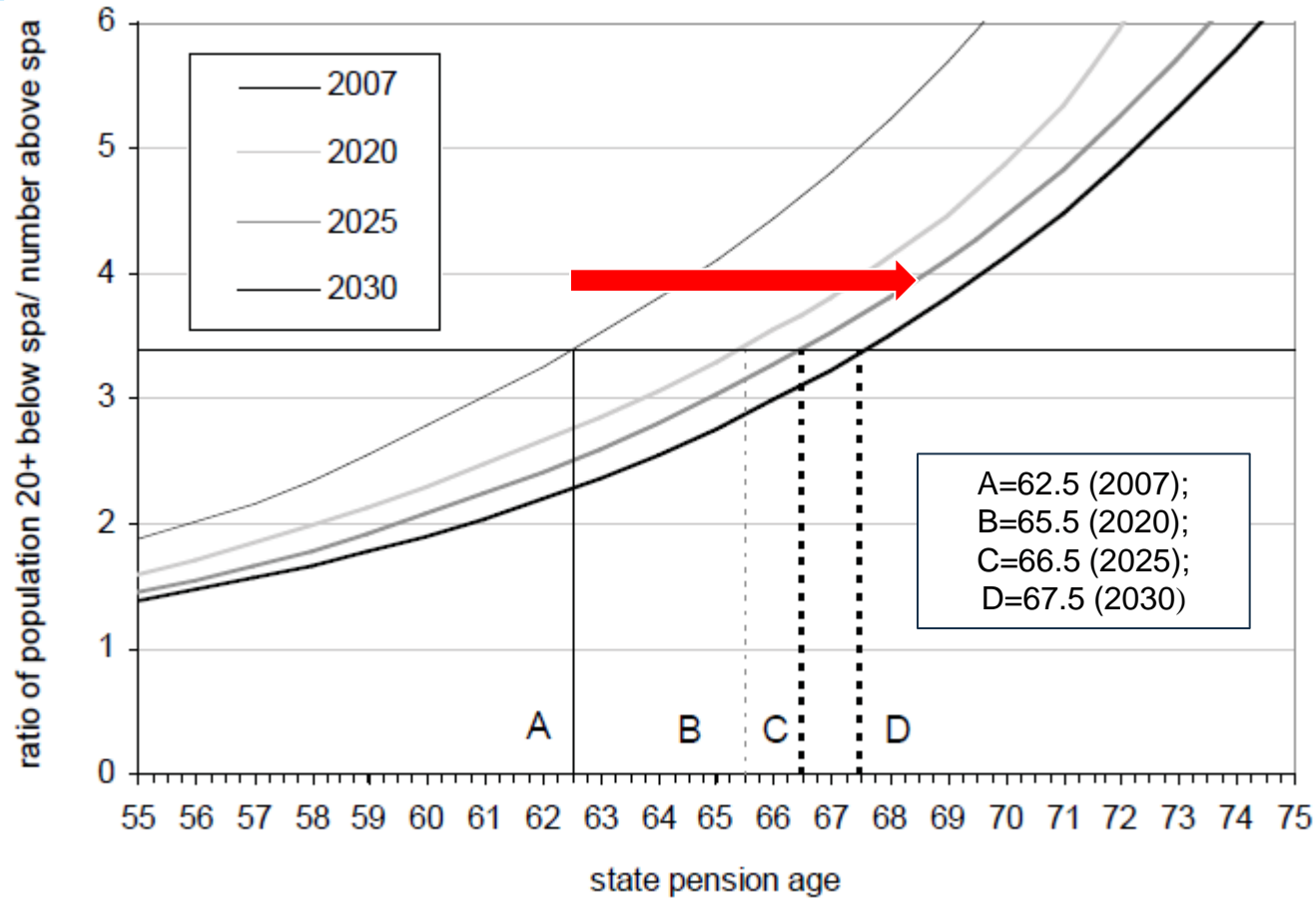
Source: Fig. A3 in Mayhew (2009)

# Support ratios in the UK



Source: Fig. A1 in Mayhew (2009)

# Increases in UK state pension age needed to maintain the same old age dependency ratio as in 2007





# Population ageing and its consequences

# Consequences of an ageing population

- Output market:
  - Demand will switch to products/services for the elderly
- Labour market:
  - Decline in relative size of economically active population unlikely to be offset by higher capital productivity:
    - unless there is more education and training to increase human capital formation
  - Average gross wages will rise:
    - Although wages and employment could fall in sectors that do not respond to the switch in demand
  - Taxes will rise to pay for higher state pensions

# Consequences of an ageing population

- Savings:
  - Total savings falls if old people save less than young people and the population is ageing:
    - Induces rise in interest rates
  - However, as the size of the younger population decreases, there is less demand for new investment:
    - Induces fall in interest rates
  - Also cohort effects:
    - Different cohorts have different savings habits
  - Overall effect on interest rates is uncertain, but most likely to be lower

# Consequences of an ageing population

- Financial capital market:
  - With an ageing population risk tolerance and risk taking will be lower and there will be a preference for more stable cash flows:
    - Bonds will be preferred to equities in investment portfolios
  - Companies will respond by undertaking lower risk projects which are financed by bonds rather than equity:
    - This will increase the relative price of bonds and reduce the relative price of equities
  - Global risk tolerance and risk taking will fall:
    - This will increase the equity premium



# Consequences of an ageing population

- Physical capital market:
  - Relative abundance of capital in countries with ageing populations will reduce returns
  - Capital will flow from rapidly ageing countries to slowly ageing countries where rates of return will be higher
  - Volatility of physical capital flows likely to increase in response to these demographic shifts

# Consequences of an ageing population

- Asset meltdown hypothesis:
  - When the baby boom generation retires, it begins to decumulate assets to pay for retirement consumption
  - Asset prices will fall, since the next generation of asset buyers is smaller in size:
    - especially house prices
- This hypothesis is a prediction of the life cycle hypothesis
- But the standard (closed economy) LCH ignores bequests and uncertainty over length of life times:
  - Many people run down assets in retirement more slowly than LCH predicts

# Consequences of an ageing population

- Also increasing global integration of financial markets could weaken any country-specific link between demographic structure and financial asset prices
  - Suggests meltdown hypothesis might be moderated by increasing wealth in emerging market economies
- However, home country bias in asset holdings might limit this globalisation effect

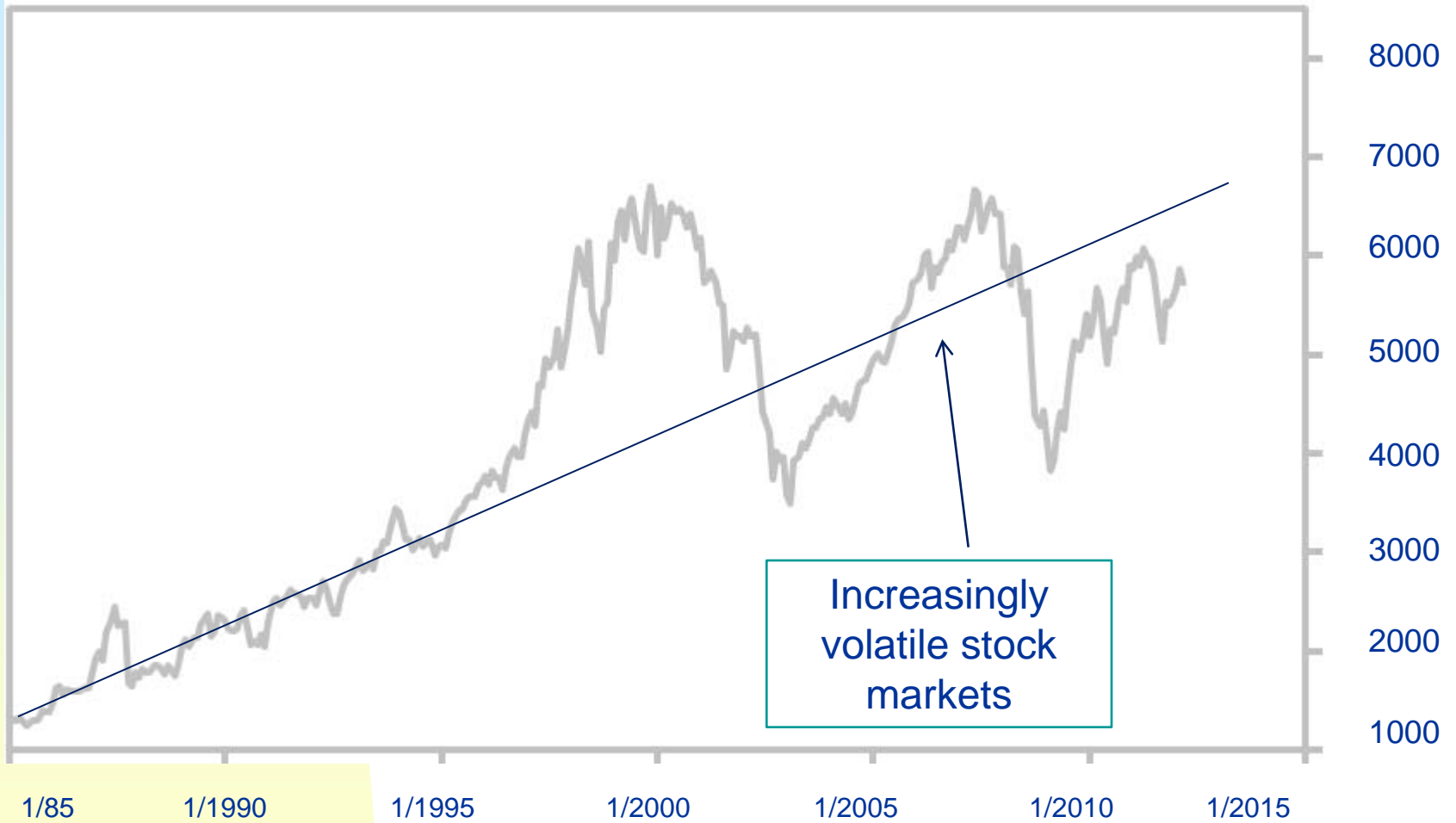
# Consequences of an ageing population

- Overall:
- Living standards likely to fall in some countries with fast-ageing populations:
  - GDP growth in EU and Japan could fall from 2% to 1% pa
    - as capital flows to economies with higher returns
- US likely to escape this fall
- Higher growth rates in countries with slower ageing populations
- Large shifts in relative economic importance away from EU and Japan:
  - McMorro and Röger (2003)

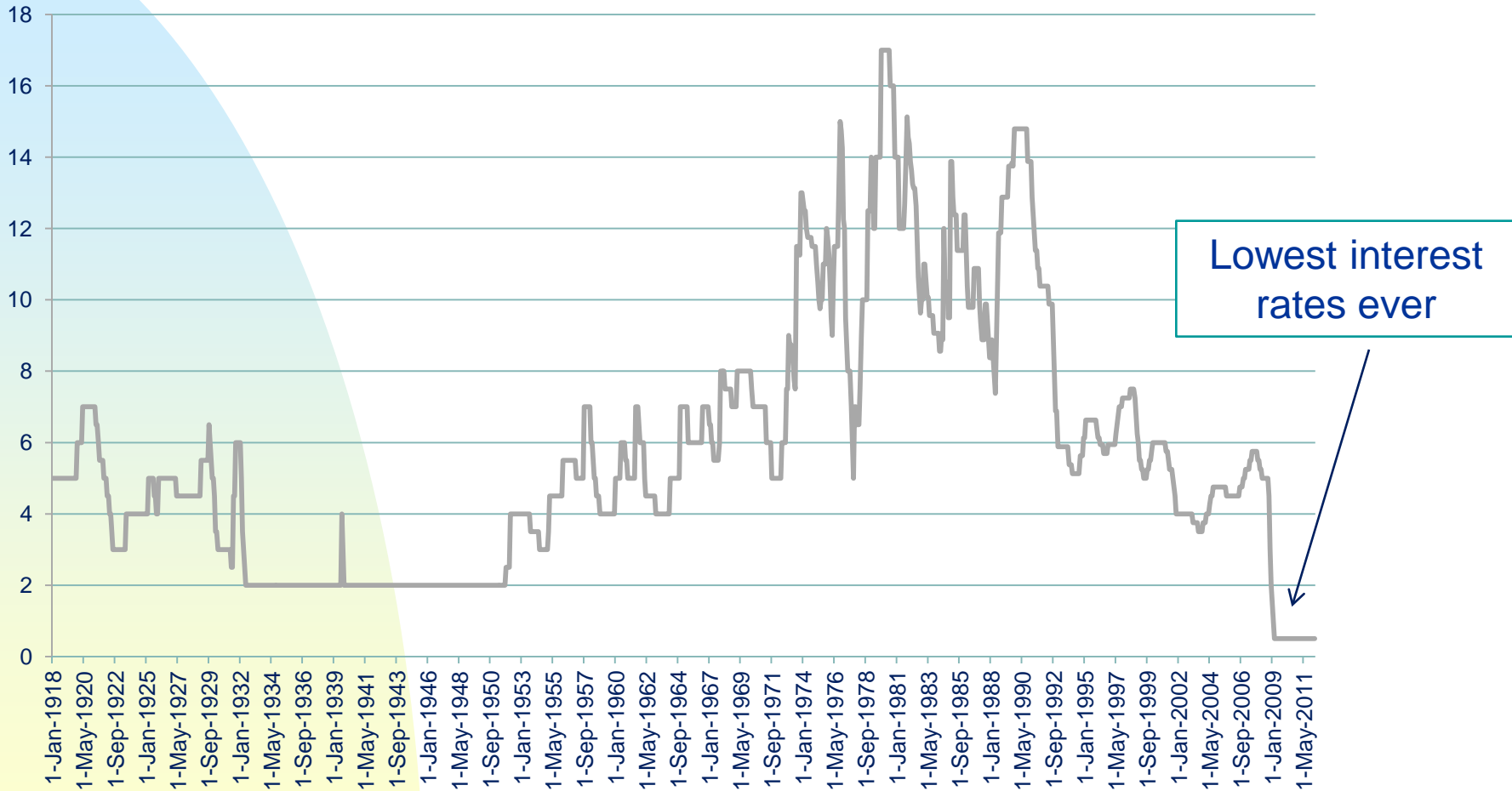


# The financial crisis and population ageing

# FTSE100 Index 1985-2012



# Bank of England base rate 1918-2012



# The financial crisis and population ageing

- Is the turbulence in stock market prices due to population ageing?
  - Mankiw and Weil (1989) argue 'yes'
  - Poterba (2001) argues 'no' since he could find no strong cohort effect:
    - Estimated financial asset profile in old age is flat:
      - for precautionary or bequest motives?
  - Börsch-Supan (2006) using open-economy model also argues 'no':
    - Capital outflows restrict price reductions in domestic economy
    - Open economies can avoid some of the demographic effects that depress saving rates and the rate of return to capital



# References

- Börsch-Supan, A. (2006). “Demographic Change, Saving and Asset Prices: Theory and Evidence”, Mannheim Research Institute (MEA)
- Mankiw, Gregory N. and Weil, David, N. (1989). “The Baby Boom, The Baby Bust and the Housing Market”, *Regional Science and Urban Economics*, 19, 235-258.
- Mayhew, L. (2009). “Increasing Longevity and the Economic Value of Healthy Ageing and Working Longer, Cass Business School
- Mayhew, L. (2000). “Health and Elderly Care Expenditure in an Aging World”, International Institute for Applied Systems Analysis, Laxenburg, Austria
- McMorrow, K. and Röger, W. (2003). “Economic and Financial Market Consequences of Ageing Populations”, Directorate-General for Economic and Financial Affairs (ECFIN) of the European Commission, Economic Paper 182
- OECD (2011). “Pensions at a Glance 2011”
- Poterba, J. M. (2001). “Demographic Structure and Asset Returns”, *Review of Economics and Statistics*, 83, 565-584

# Controlling Public Spending in Advanced Economies: Reforming health and pension spending

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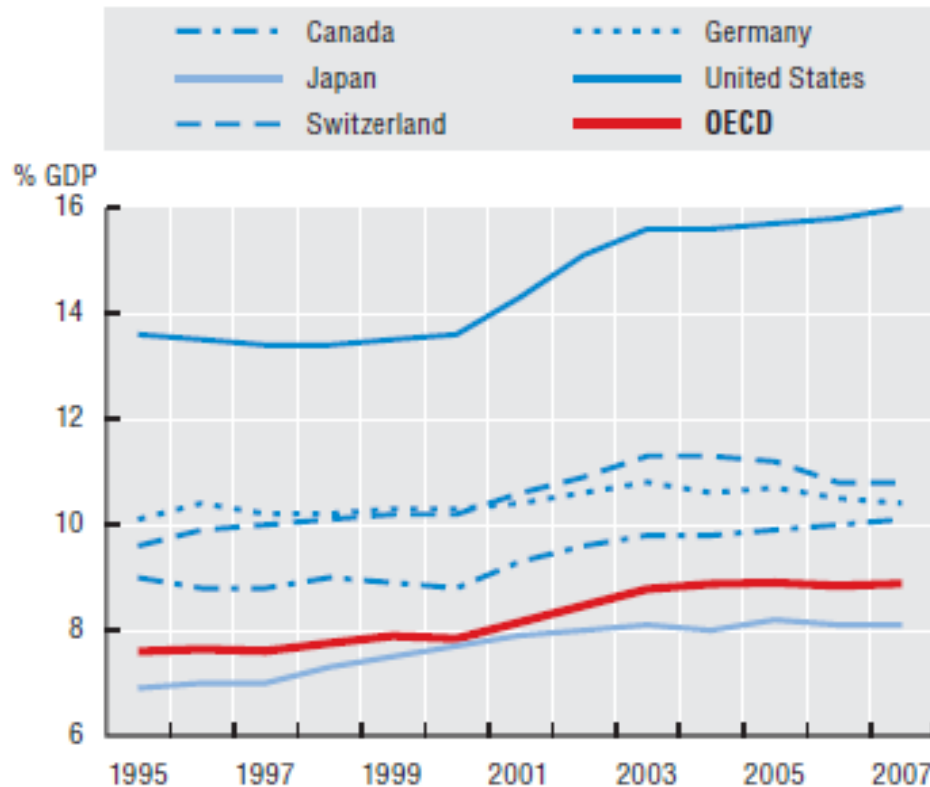
# Agenda

- Expenditure on health and pensions: Current and projected
- Key to reforming health and pensions
- Health:
  - Where health and disability expenditures are concentrated
  - The required reforms to health and disability policies
- Pensions and labour markets:
  - What are the weaknesses in the labour market and pensions
  - The required reforms to labour market and pensions policies
- Conclusion



**Expenditure on health and  
pensions:  
Current and projected**

# Total health expenditure (% of GDP), selected OECD countries, 1995-2007



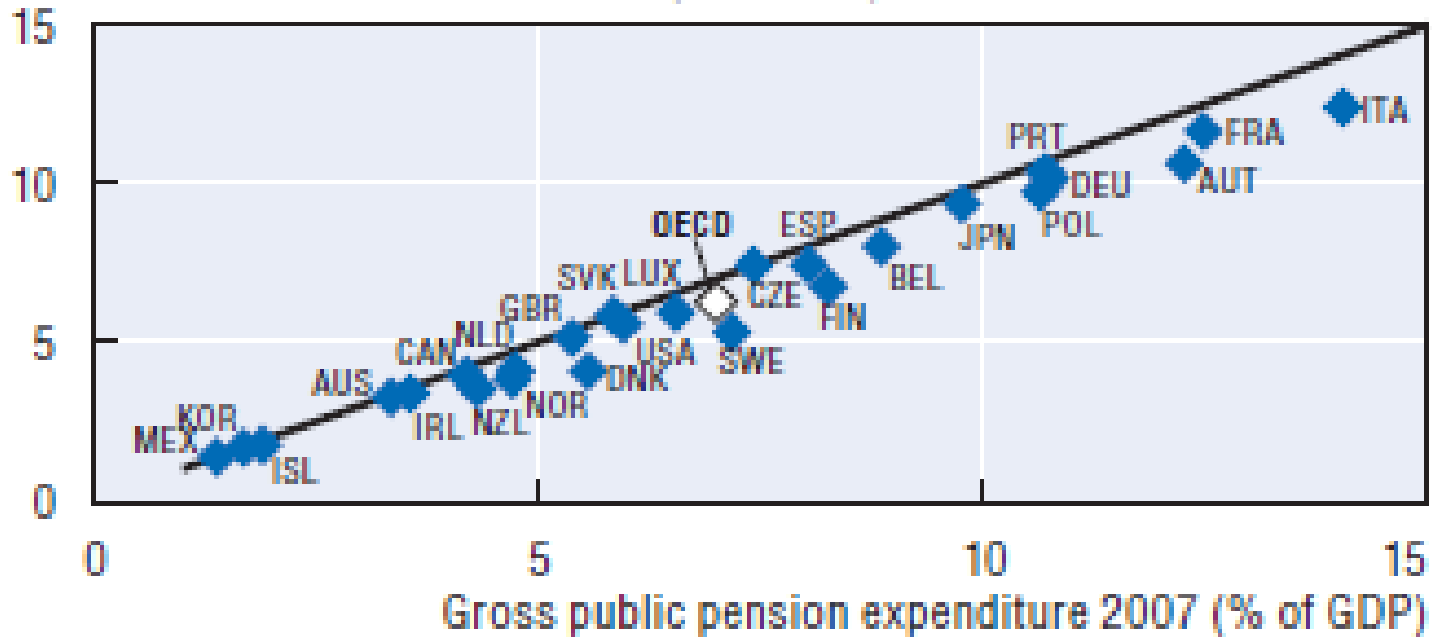
8.9%  
in 2007

12.8%  
in 2050

Source: OECD Health Data 2009.

# Gross and net public pension expenditure (% of GDP) in OECD countries, 2007

Net public pension expenditure 2007 (% of GDP)



7.0%  
in 2007

11.4%  
in 2050

Source: p.155, Pensions at a Glance 2011, OECD



# Key to reforming health and pensions

# Key to reforming health and pensions

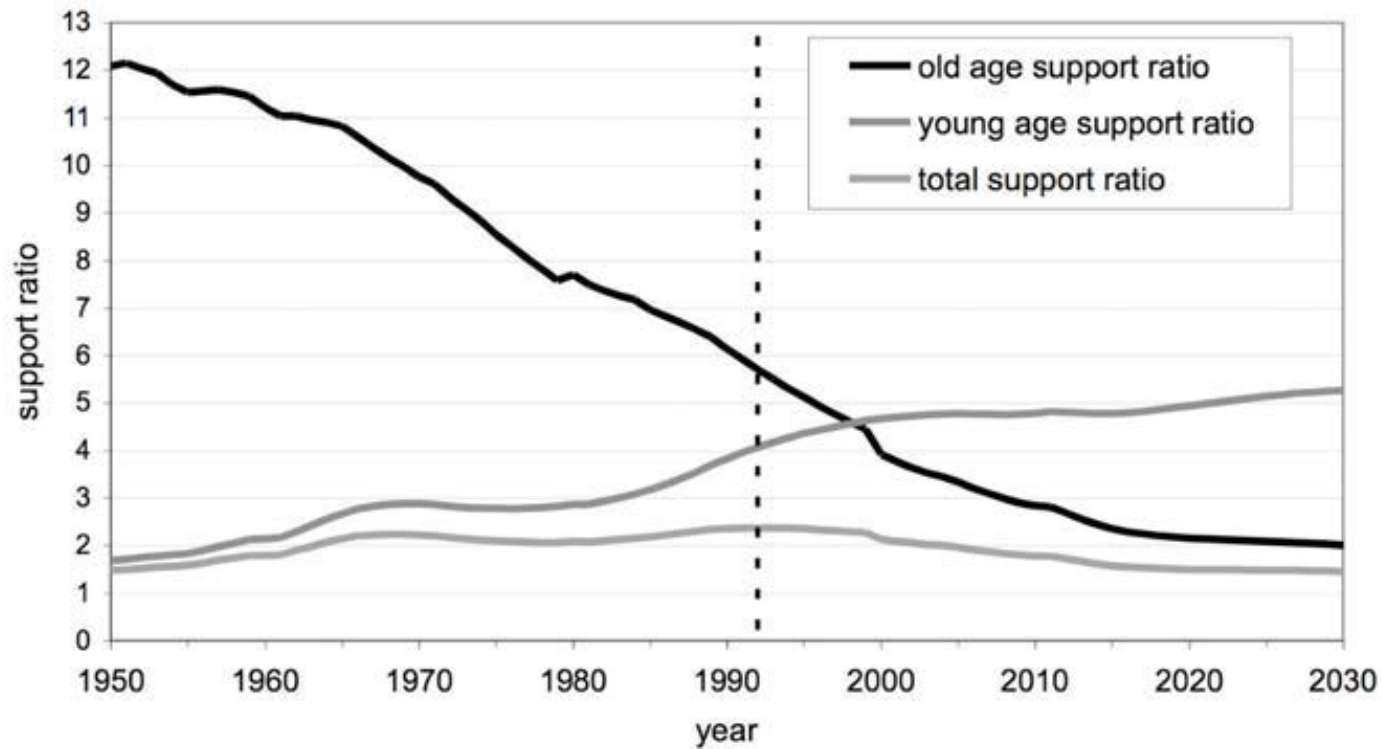
- The key is to recognise that the primary cause of increasing public health and pensions expenditure is demographic rather than financial
- There are 4 key demographic variables:
  - Total support ratio (TSR)
  - Life expectancy (LE)
  - Working life expectancy (WLE)
  - Healthy life expectancy (HLE)



# Total support ratio (TSR)

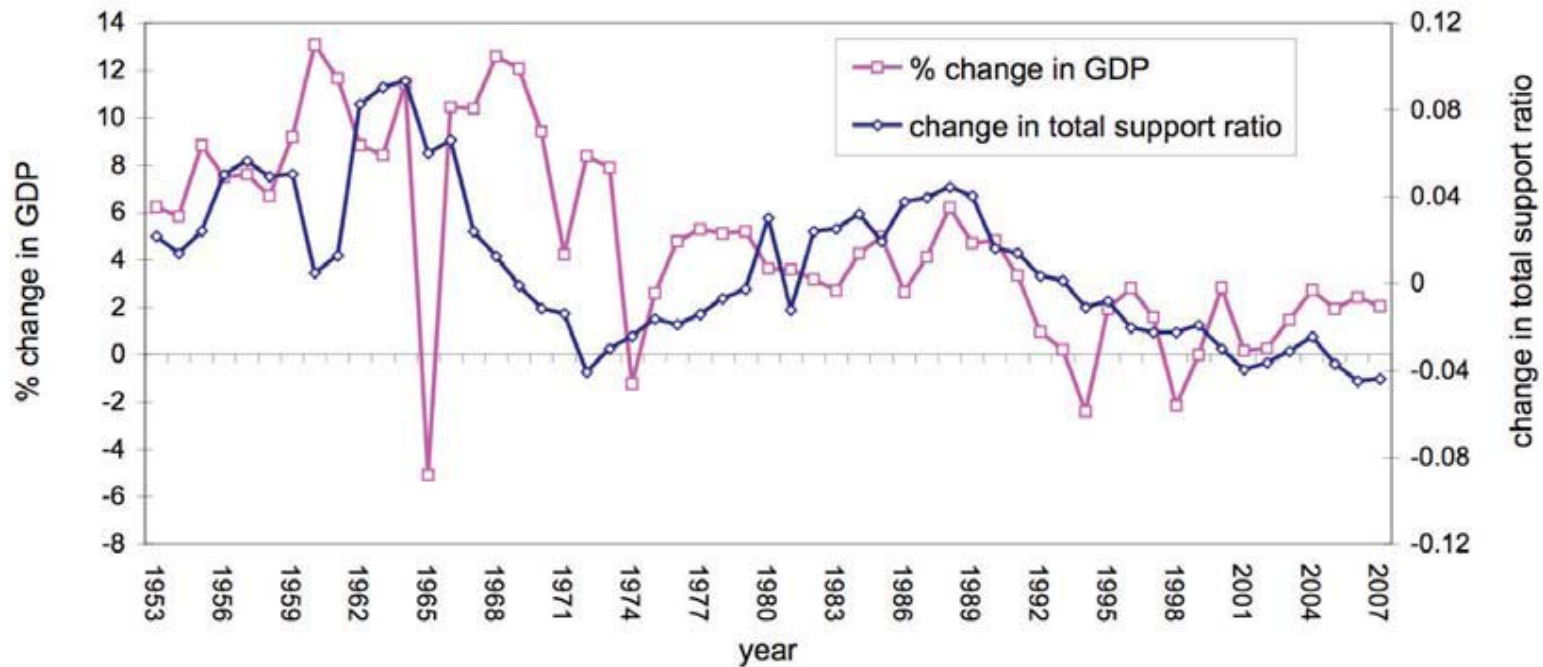
- Ratio of the number of workers to the number of both young and old people
  - High TSR is typically associated with rapid economic growth
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- In Japan, TSR peaked in 1992 and its economy has been fairly static since
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# Support ratios in Japan



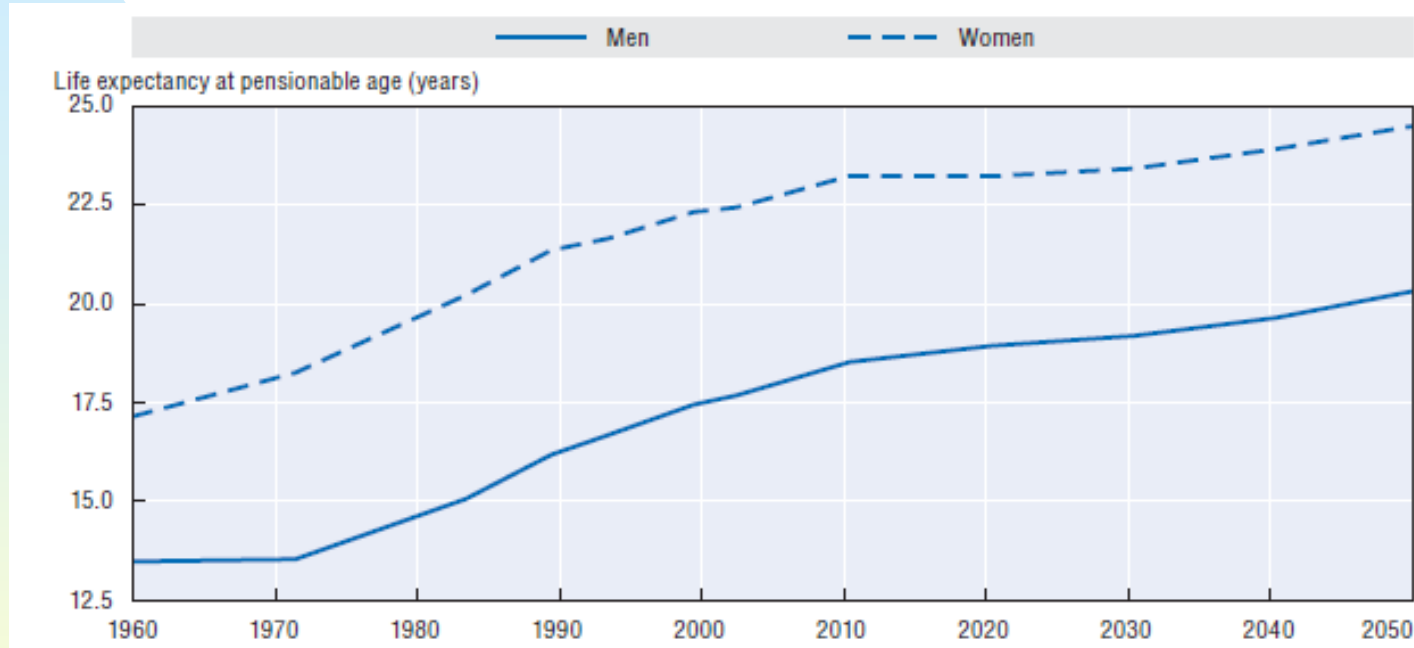
Source: Fig. A2 in Mayhew (2009)

# Relationship between growth rate in GDP and changes in TSR in Japan



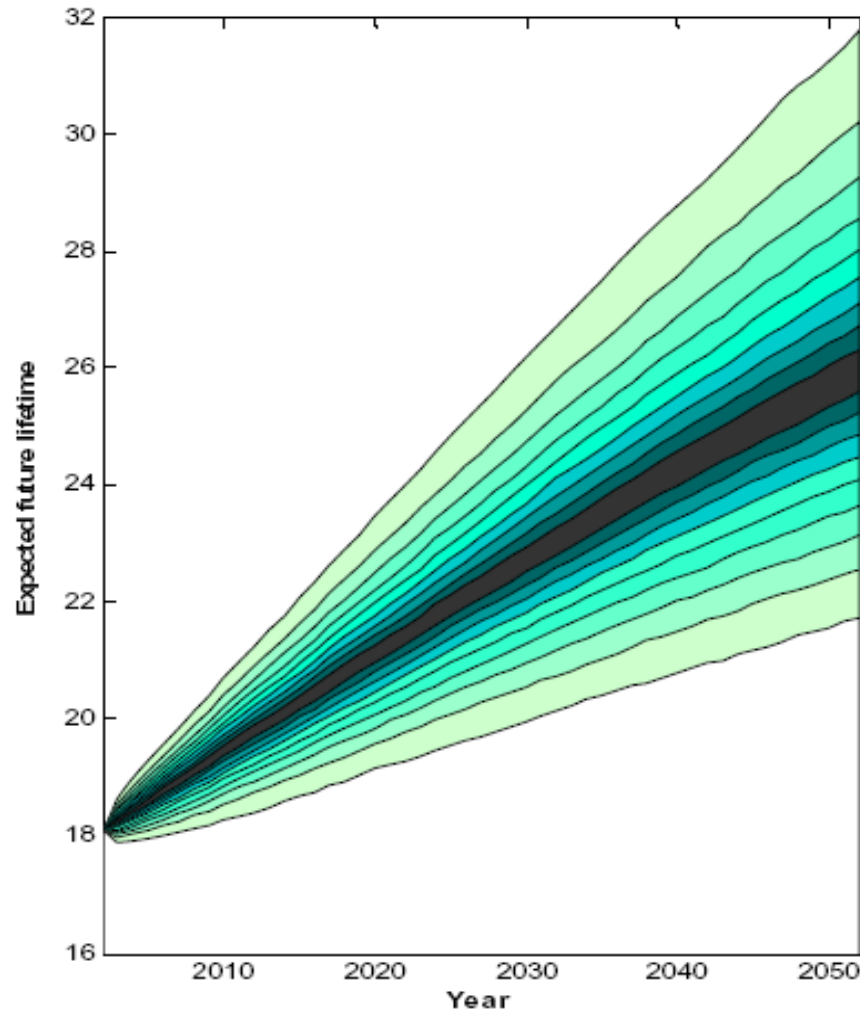
Source: Fig. A3 in Mayhew (2009)

# Life expectancy after pensionable age by sex: Historical and projected values, 1960-2050



Source: Fig 1.7, Pensions at a Glance 2011, OECD

# Huge uncertainty surrounding life expectancy: Longevity fan chart for 65-year old UK males



Derived from Cairns-Blake-Dowd stochastic mortality model

## LE v HLE at birth in 2003

	<b>LE</b>	<b>HLE</b>	<b>Difference</b>
Japan	82	75	7
UK	79	71	8
USA	78	69	9

## Projected LE v HLE at birth in UK

	<b>LE</b>	<b>HLE</b>	<b>Difference</b>
2005	79.1	69.3	9.75
2025	83.2	71.7	11.48
Increase	4.1	2.4	

- Gap between LE and HLE increasing at the rate of 28.8 days p.a.
- One reason is successful medical interventions in managing heart disease

# Measures required to reform pensions and health

- The key measures are:
  - Increase TSR
  - Increase WLE and HLE in line with increases in LE
- Failure to do this will lead to:
  - Increased taxes and reduced standards of living
  - Increased labour migration with consequential strains on the economic and social infrastructure





# Health



**Where health and disability  
expenditures are concentrated**

# Relative per capita health care expenditure by age group, England and Wales, 1980-1990

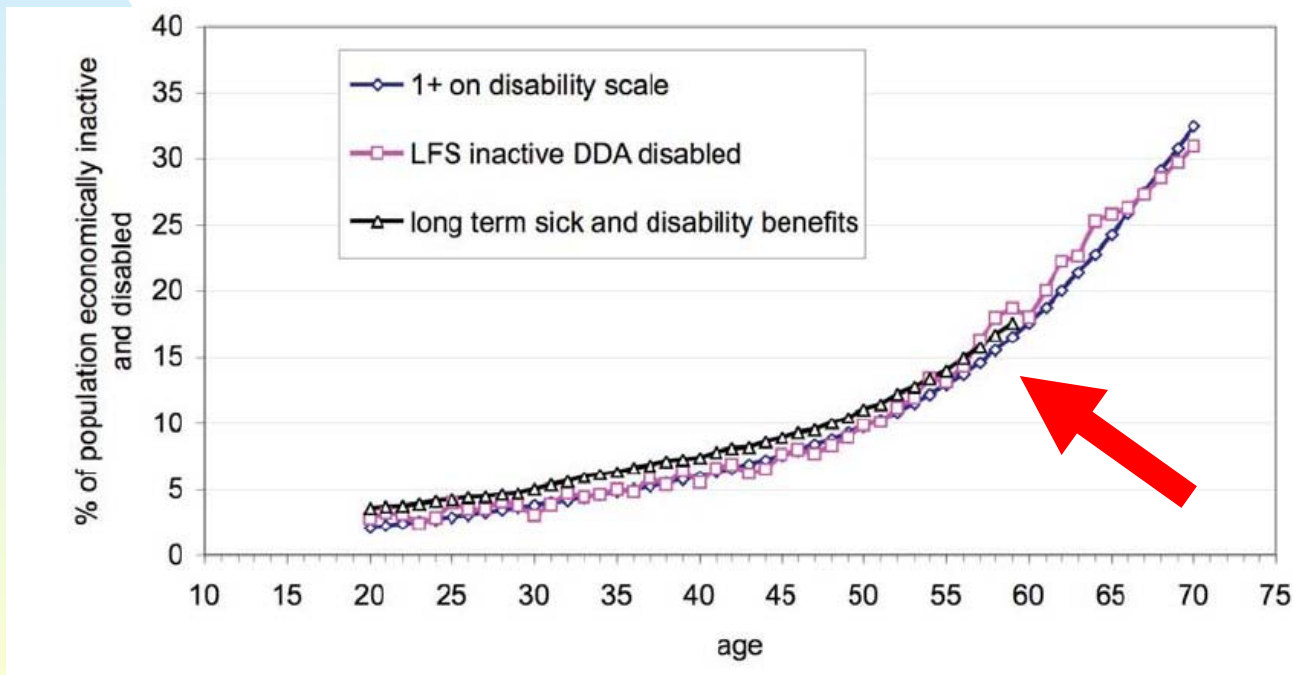
- Health costs are concentrated at high ages
- But are also 'high' in the 45-64 age group

Age group	Relative expenditure
0-4	1.00
5-14	0.40
15-44	0.53
45-64	0.82
65-74	1.70
75-84	3.20
85+	5.52



# Percentage of the population disabled and economically inactive in the UK

- Disability is 'high' in the 45-64 age group



Estimates from Labour Force Survey, benefit claimants, and the Rickayzen-Walsh model from age 20 to 70

# Survival curve for the UK population by disability category

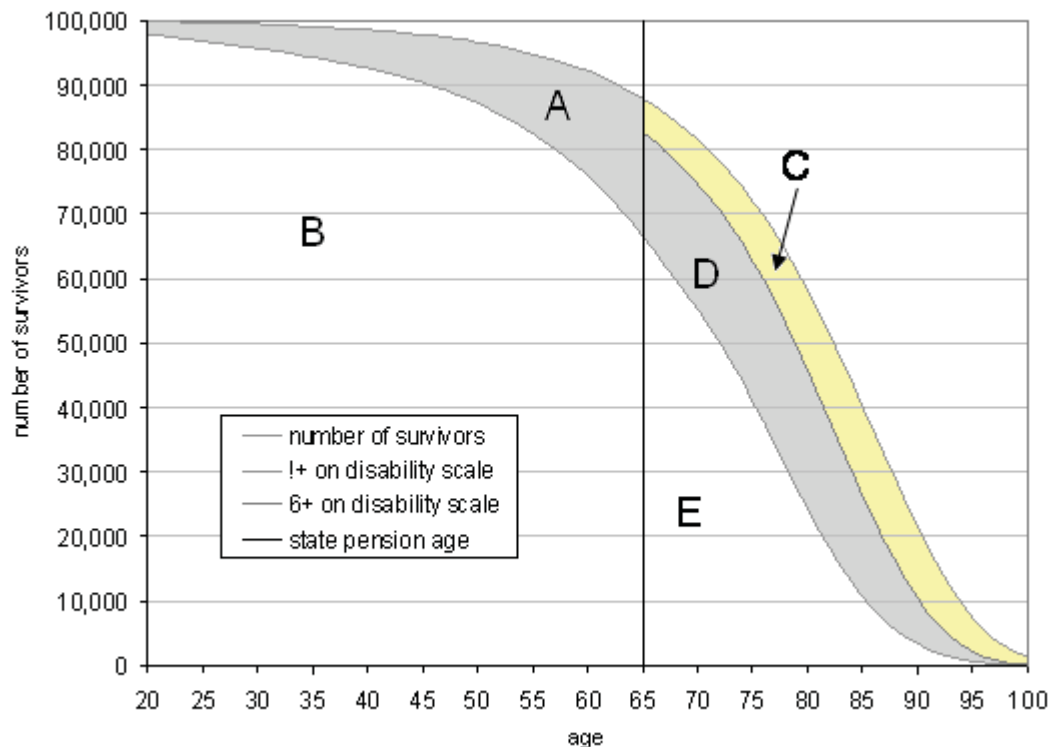
A: Disabled, working age, 2.9m

B: Healthy, working age, 32.6m

C: Severely disabled, retired, 1.7m

D: Disabled, retired, 2.7m

E: Healthy, retired, 5.1m





# The required reforms to health and disability policies

# Health reforms

- Three possible policies to increase HLE in line with LE:
  - Encourage healthier lifestyles
  - Increase spending on health care
  - Reduce inequalities

# Encourage healthier lifestyles

- Encourage more healthy lifestyles and more 'active ageing'
- Governments do spend huge sums to improve health via prevention and educational programmes, targeting:
  - Obesity, food additives, excessive alcohol consumption, smoking, drugs
- Sensible, but evidence of cost effectiveness is still uncertain, since payoffs are long-term

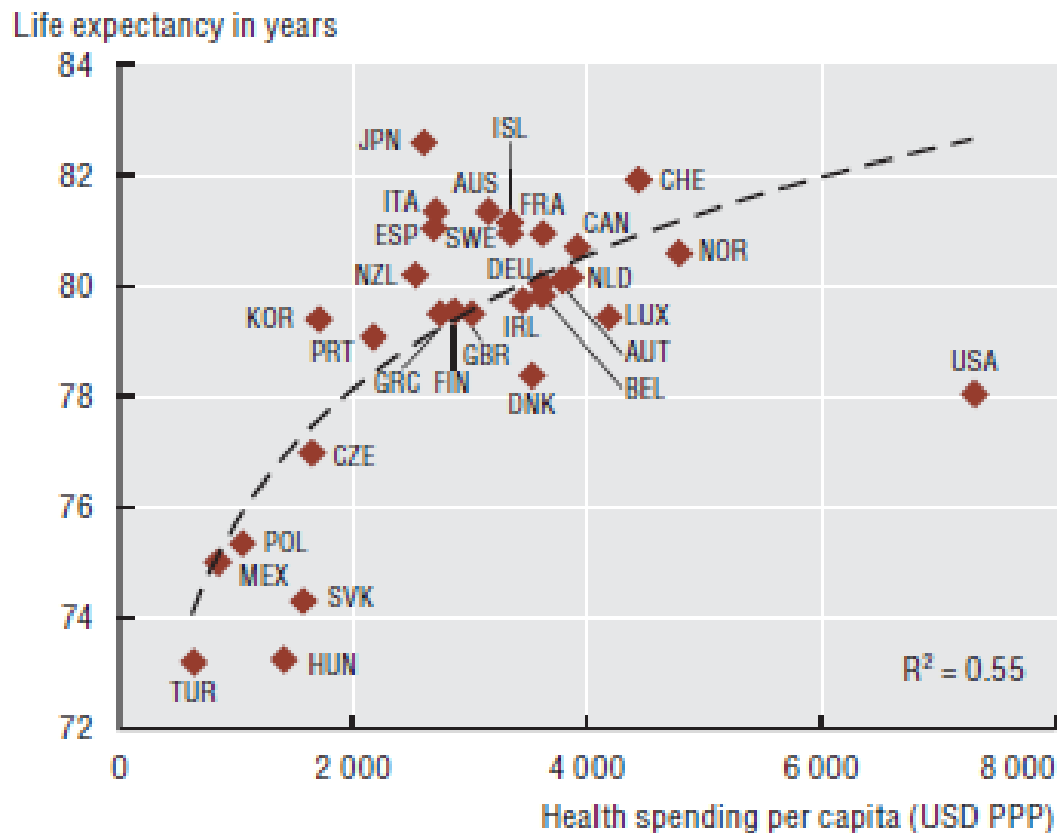


# Increase spending on health care

- Always public pressure to do this
- But impact could be limited due to diminishing returns to health improvement at current levels of spending.
- Complete cessation of smoking would yield a far greater increase in HLE than a 50% increase in healthcare spending:
  - Approximately £50bn a year in UK

# Life expectancy at birth and health spending per capita, 2007

- A positive relationship, but diminishing returns



# Reduce inequalities

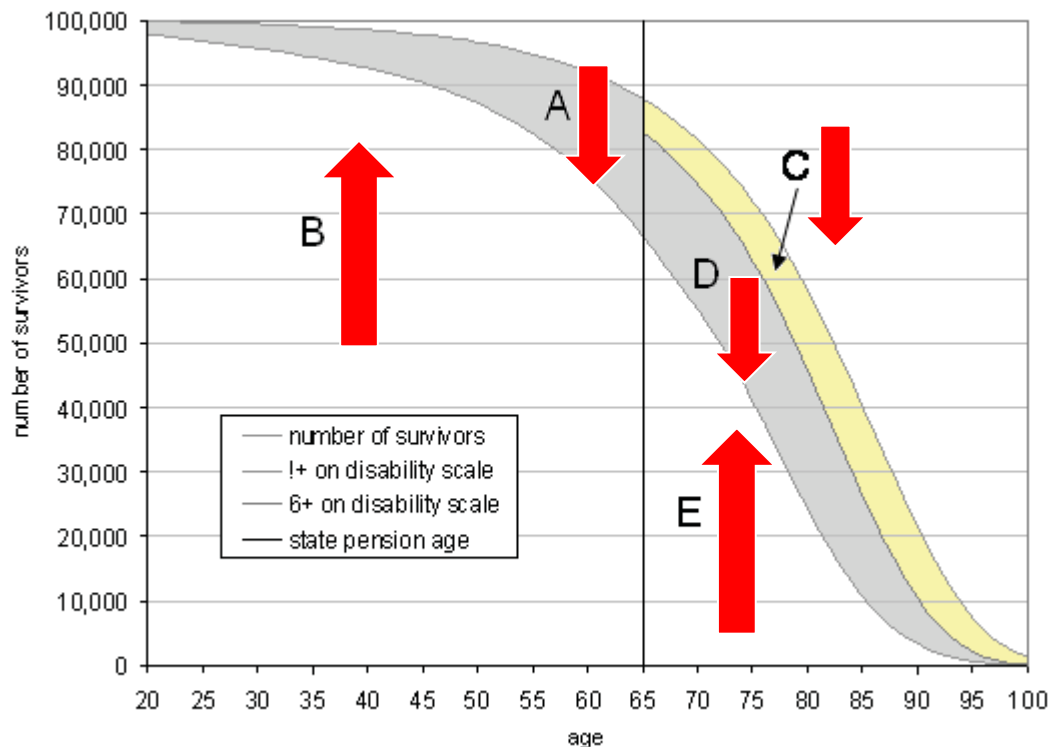
- Ill health is often associated with social inequalities and deprivation
- A reduction in inequalities in society can lead to improved health and longevity:
  - Income
  - Wealth
  - Housing
  - Education
  - Access to services

# Disability benefit reforms

- The number of people on long-term sick and disability benefits needs to be reduced
  - Some of these are genuine cases of poor health, but many are not.
- With the decline of traditional industries such as mining and heavy industry, it is harder to determine the true health status of an individual and the reasons for claiming benefits has changed:
  - More claims for mental health reasons (depression) and office-related problems (back ache)

# Impact of successful health and disability reforms

## Survival curve for the UK population by disability category



A: Disabled, working age, 2.9m

B: Healthy, working age, 32.6m

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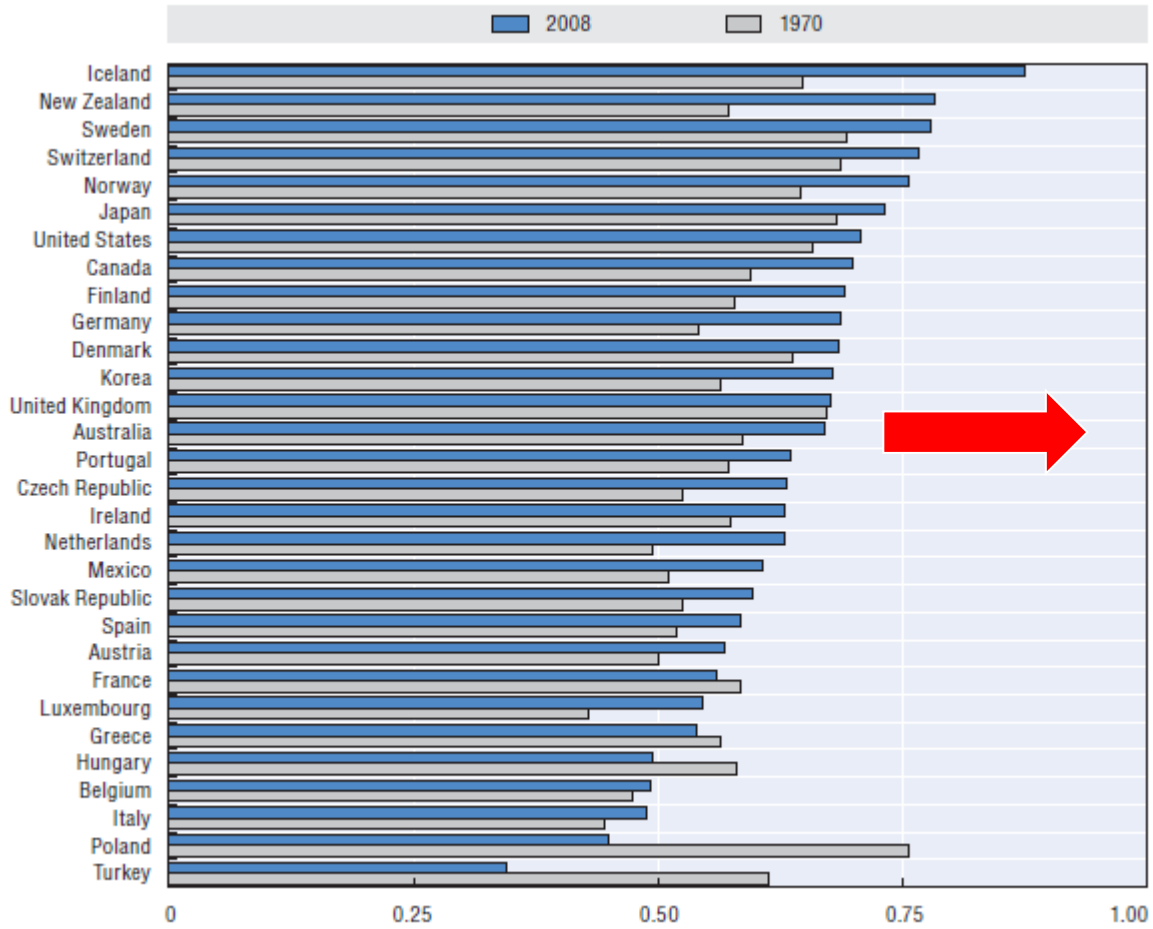


# Pensions and labour markets



# What are the weaknesses in the labour market and pensions

# Participation rates of 50-64 year-olds in 1970 and 2008



63%  
in 2008

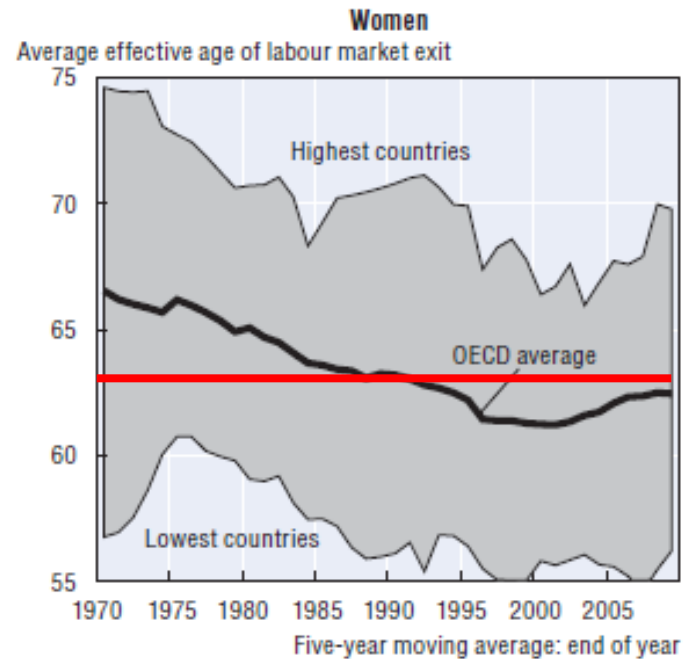
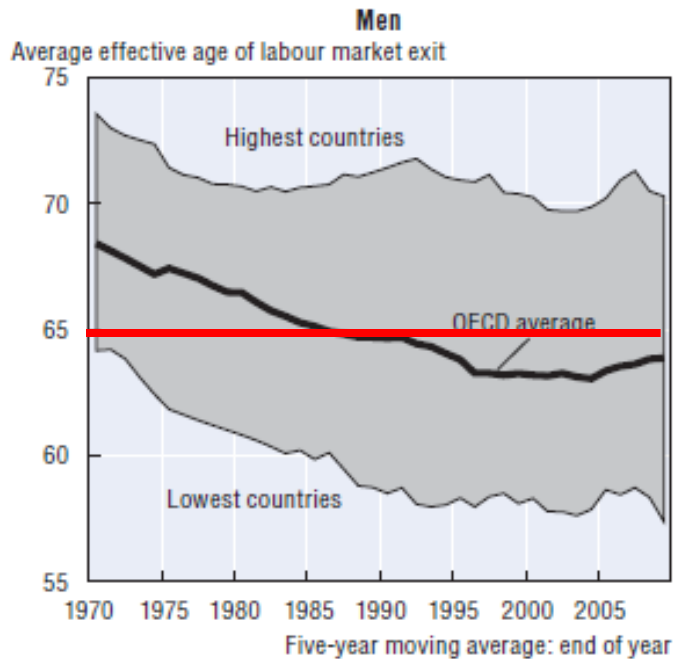
Source: D'Addio et al. (2010) based on OECD Employment Database.

Source: Fig 2.1, Pensions at a Glance 2011, OECD



# Average labour market exit age in OECD countries, 1965-2007

- In many cases, exit occurs below official state pension age (red line)



Source: OECD, updated from OECD (2006).



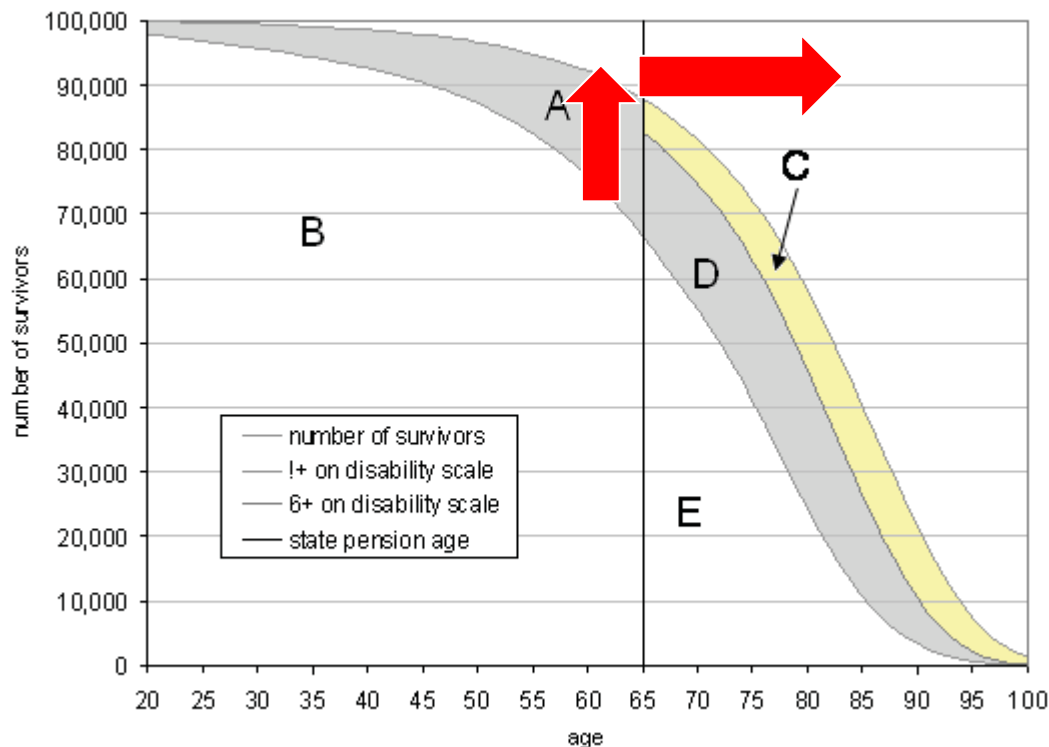
# The required reforms to labour market and pensions policies

# Labour market reforms

- Increase participation rates pre-retirement
  - 2% increase in labour participation rates implies 1 year increase in WLE
- Encourage later retirement
- Encourage post-retirement work

# Impact of successful pension and labour market reforms

## Survival curve for the UK population by disability category



A: Disabled,  
working age,  
2.9m

B: Healthy,  
working age,  
32.6m

C: Severely  
disabled,  
retired, 1.7m

D: Disabled,  
retired,  
2.7m

E: Healthy,  
retired,  
5.1m

# Pension reforms

- Parametric:
  - Increase state pension age
    - Link pension age to increase in life expectancy
  - Reduce pension benefits and link to life expectancy
- Systemic:
  - Switch from defined benefit to defined contribution:
    - Private FDC (eg, Chile)
    - Public NDC (eg, Sweden)

# Impact of changes to UK benefit expenditure as a result of hypothetical changes in state pension age based on the population in 2007

state pension age	pensions (£s bns p.a.)	sick and disability benefits pre-SPA (£s bns p.a.)	disability benefits post SPA (£s bns p.a.)	total net change (£s bns p.a.)
60	0.0	0.0	0.0	0.0
61	-3.4	0.6	-0.2	-2.9
62	-6.6	1.3	-0.3	-5.7
63	-9.8	2.0	-0.5	-8.3
64	-12.8	2.7	-0.6	-10.8
65	-15.6	3.3	-0.8	-13.1
66	-18.1	4.0	-1.0	-15.1
67	-20.8	4.7	-1.1	-17.2
68	-23.4	5.5	-1.3	-19.3
69	-26.0	6.3	-1.5	-21.2
70	-28.5	7.1	-1.7	-23.1



# Conclusion

# Conclusion

- The following measures are needed to control the future growth in health and pension costs:
- WLE needs to increase:
  - People need to work longer and more productively, achieved by
    - Increasing labour participation rates, especially in the period leading up to retirement
  - Increasing state pension age
  - Delaying retirement
  - Working part-time after retirement



# Conclusion

- HLE needs to increase, both pre- and post-retirement :
  - The number of people on long-term sick and disability benefits needs to be reduced:
    - Some of these are genuine cases of poor health, but many are not.
  - Incentives to work rather than take benefits need to be improved:
    - Average earnings peak in 40s and benefit replacement rates can be high for many in 50+ age group.

# Conclusion

- Policies need to be implemented that promote healthy lifestyles and 'active ageing' in order to increase WLE and HLE in line with LE and hence increase the TSR.



**Thank you!**

# Key references

- Mayhew, L. (2009) Increasing longevity and the economic value of healthy ageing and working longer, Cass Business School
- Mayhew, L. (2000) Health and Elderly Care Expenditure in an Aging World, International Institute for Applied Systems Analysis, Laxenburg, Austria
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- OECD (2009) Health at a Glance 2009