



HM TREASURY

# Long-term Public Finance Projections

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ESRC Research Methods Festival

3 July 2008

# Overview (I)

- Background
  - Fiscal Framework
  - Long-term demographic challenges
  - Monitoring public finances in long term
- Long-term budgetary projections
  - Population and employment
  - GDP projections
  - Projecting public spending and revenues



# Overview (II)

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- Results
  - Spending and Revenue Projections
  - Assessing fiscal sustainability
- Challenges
  - Defining current policy
  - Modelling uncertainty
  - Coverage of long-term challenges
- Conclusion



# Background

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- Fiscal framework
- Long-term demographic challenges
- Understanding future fiscal pressures



# Fiscal Framework

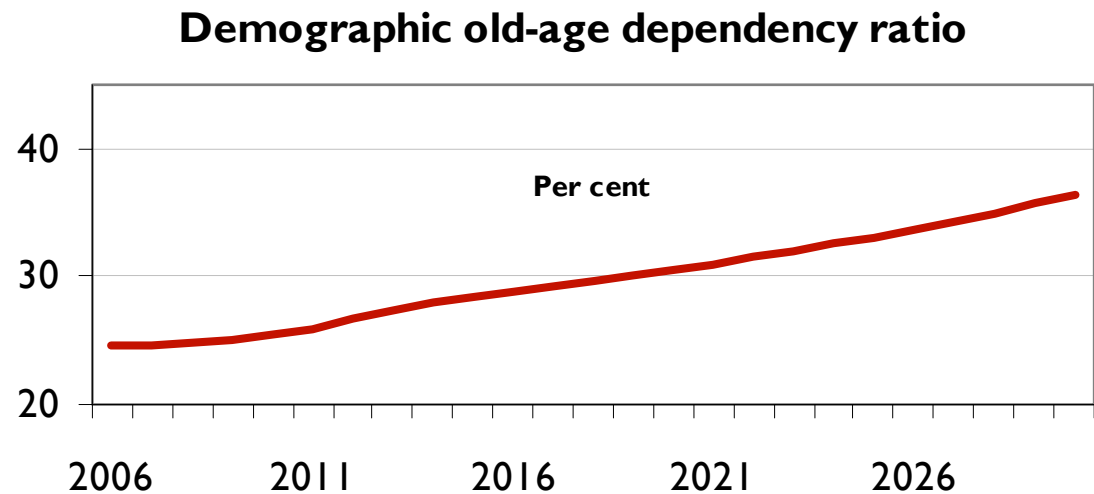
- Code for Fiscal Stability: Objectives for Fiscal Policy include “ensure sound public finances and that spending and taxation impact fairly both within and between generations”
- Public finances over long term
  - Inter-generational fairness
  - Long-term sustainability
- Inter-temporal budget constraint

$$D_{t_0} + \sum_{t=t_0+1}^{\infty} \frac{S_t}{(1+r)^{t-t_0}} = \sum_{t=t_0+1}^{\infty} \frac{R_t}{(1+r)^{t-t_0}}$$



# Long-term Demographic Challenges

- Ageing population (increasing longevity, low fertility and ageing of 'baby boomer' cohorts)
  - **Economy:** shrinking workforce supporting growing number of retirees
  - **Public finances:** pressures from lower revenues and higher public spending from older people



# Monitoring Long-term Public Finances

- Understanding implications of current policy on current and future generations – in light of demographic change
- *Code for Fiscal Stability*: Illustrative Long-term Fiscal Projections covering at least 10 years
  - Top-down (overview of fiscal aggregates – constraint development)
  - Bottom up projections (detailed analysis of spending and revenue pressures – unconstraint development)



# Long-term Budgetary Projections

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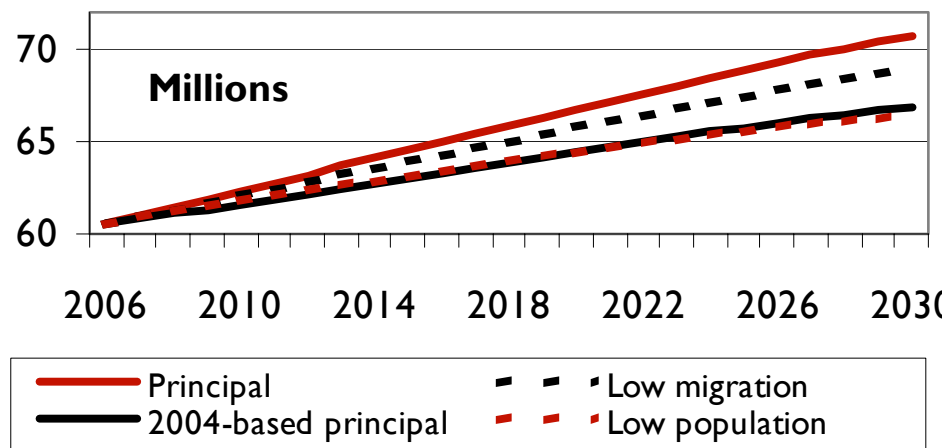
- Population and employment
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- Projecting public spending and revenues





# Population

- ONS population projections
- Uncertainty – population variants



|  | Assumptions |                |                     |         |               |
|--|-------------|----------------|---------------------|---------|---------------|
|  | Principal   | Low population | Low life expectancy | Old     | Low migration |
| Fertility rate <sup>1</sup>            | 1.84        | 1.64           | 1.84                | 1.64    | 1.84          |
| Life expectancy at birth               |             |                |                     |         |               |
| Males                                  | 82.7        | 80.7           | 80.7                | 84.7    | 82.7          |
| Females                                | 86.2        | 84.9           | 84.9                | 87.5    | 86.2          |
| Long-term average annual net migration | 190,000     | 130,000        | 190,000             | 130,000 | 130,000       |

<sup>1</sup> Long-term average number of children per woman.

Source: Office for National Statistics, 2006-based national population projections.



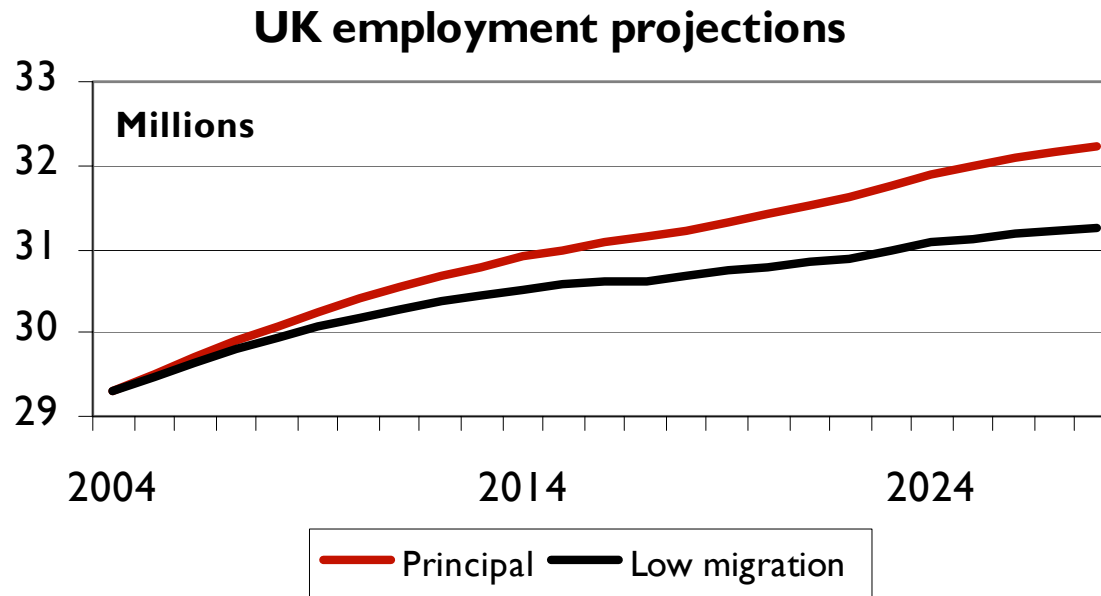
# Employment (I)

- “Cohort method”: Latulippe (1996); Scherer (2002)
- Used by OECD and European Commission
- Projections of participation rates by single year of age/gender
- Captures:
  - Negative impact of an ageing population on overall participation rates
  - Cohort/intergenerational effect



# Employment (II): Methodology

1. Entry and exit rates
2. Apply to current participation rates
  - Generates projection:  $PR_{30}^{2008} = f(PR_{29}^{2007}, ent_{30}, ex_{30})$
3. Repeat for all ages, by gender



# Employment (III): Issues

- Entry and exit rates
  - Cyclical effects
  - Recent trends
- Planned increases in the State Pension age
  - Adjust labour market behaviour at later ages
- Behavioural changes (full-time/part-time)
- Future cohorts



# GDP Projections

- Labour market projections: employment growth of around  $\frac{1}{4}$  –  $\frac{1}{2}$  per cent
- Assume 2 per cent productivity growth
- Results for baseline real GDP growth:

| Year            | 2017-18<br>to 2026-27 | 2027-28<br>to 2036-37 | 2037-38<br>to 2046-47 | 2047-48<br>to 2056-57 |
|-----------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Productivity    | 2                     | 2                     | 2                     | 2                     |
| Employment      | 0.25                  | 0.25                  | 0.5                   | 0.25                  |
| <b>Real GDP</b> | <b>2.25</b>           | <b>2.25</b>           | <b>2.5</b>            | <b>2.25</b>           |



# Projecting Spending and Revenues (I): Methodology

- UK Generational Accounts: Kotlikoff, Sefton and Cardelli (1998), NIESR (2002)
- Long-term projection of spending and revenues, taking into account overlapping generations
- Captures changes in:
  - Population size
  - Demographic structure of the population (age, gender)
- Exceptions: pensions and social security benefits (DWP)

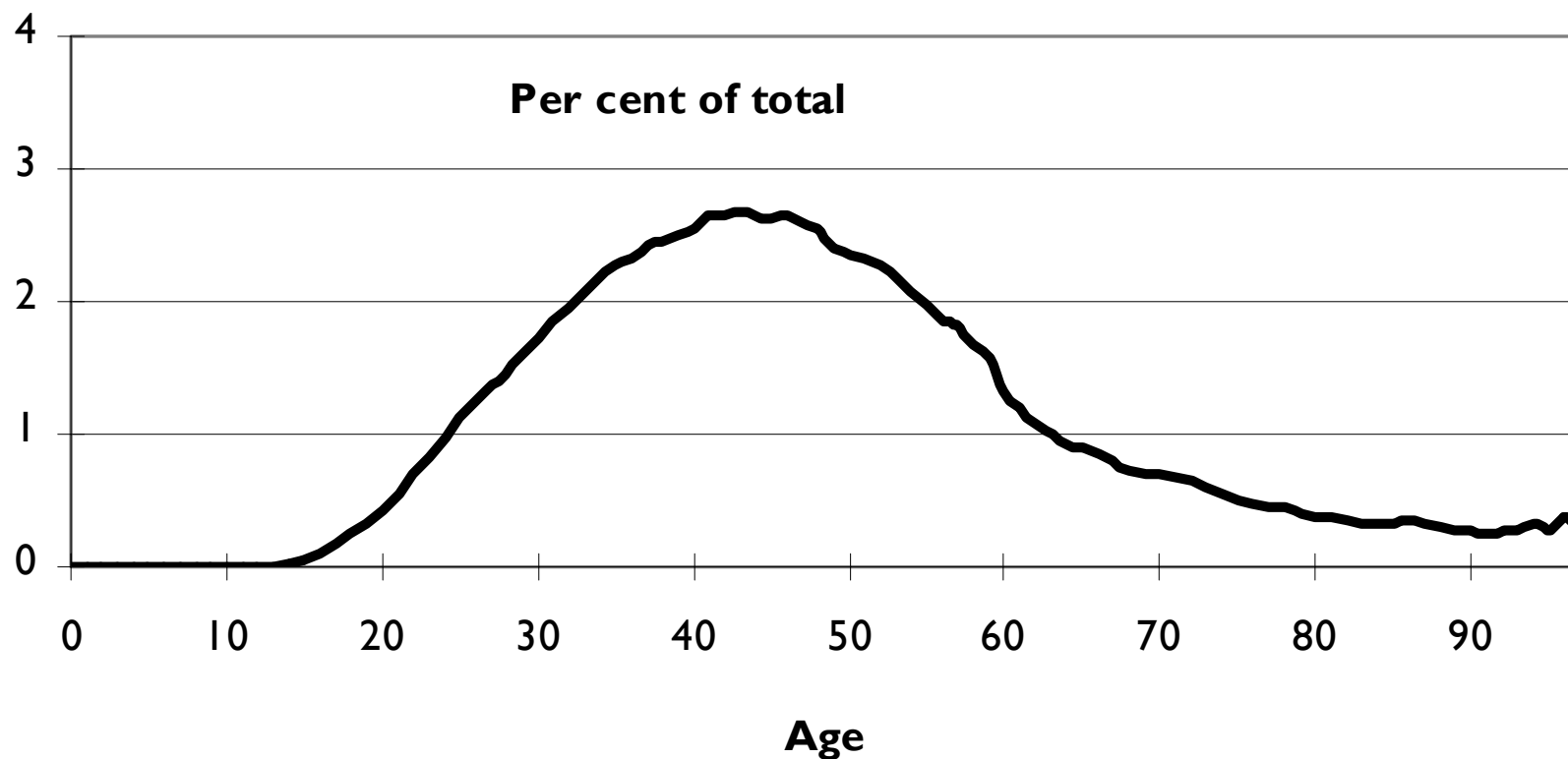


## Generational Accounting Method:

- Separately project each spending and revenue item:
  1. Proportion of per capita lifetime spending at each age (Age-profiles)
  2. Combined with projected demographic structure and size of population
  3. Repeat for all spending and revenue items

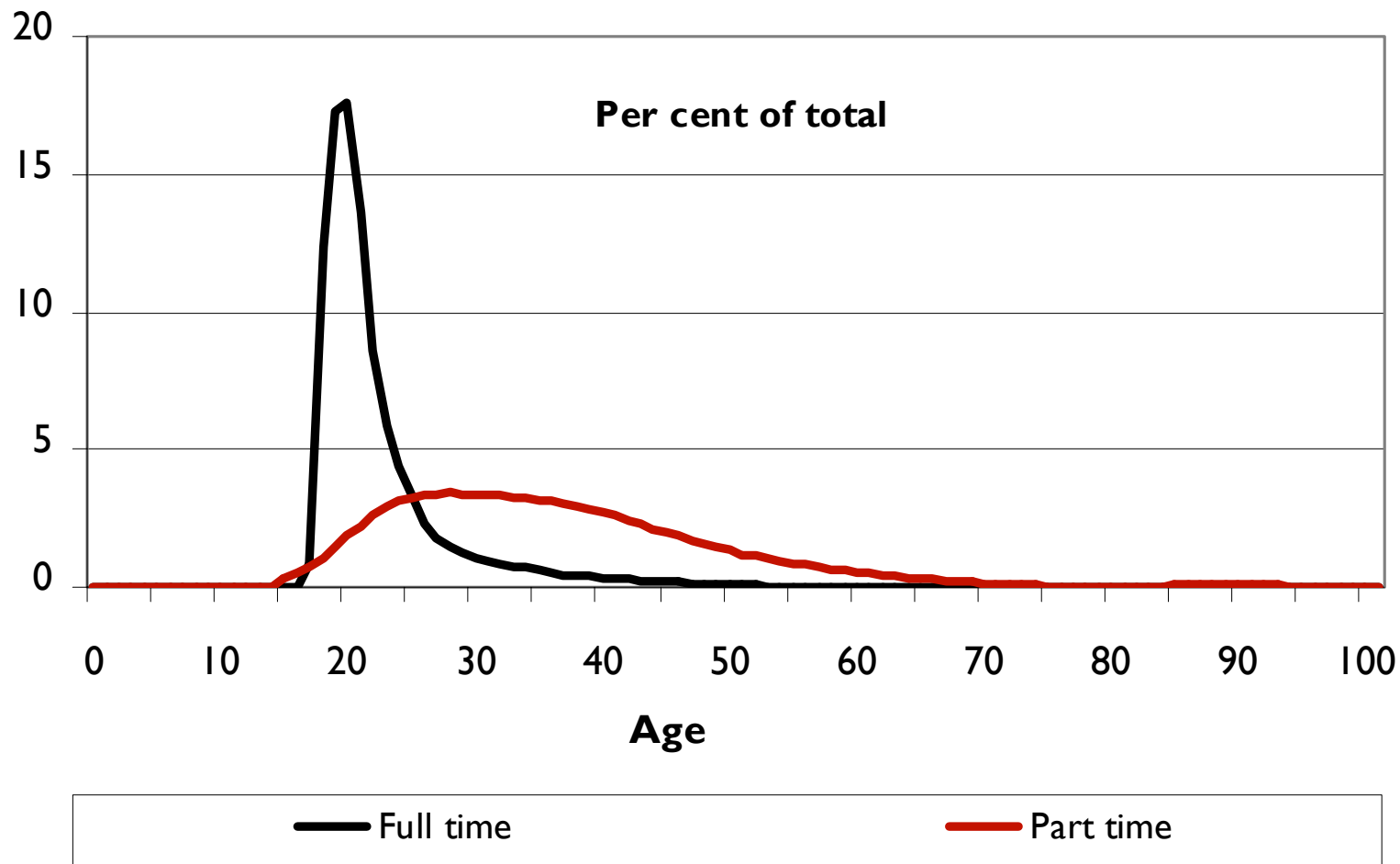


# Age-profile: Income tax (males)

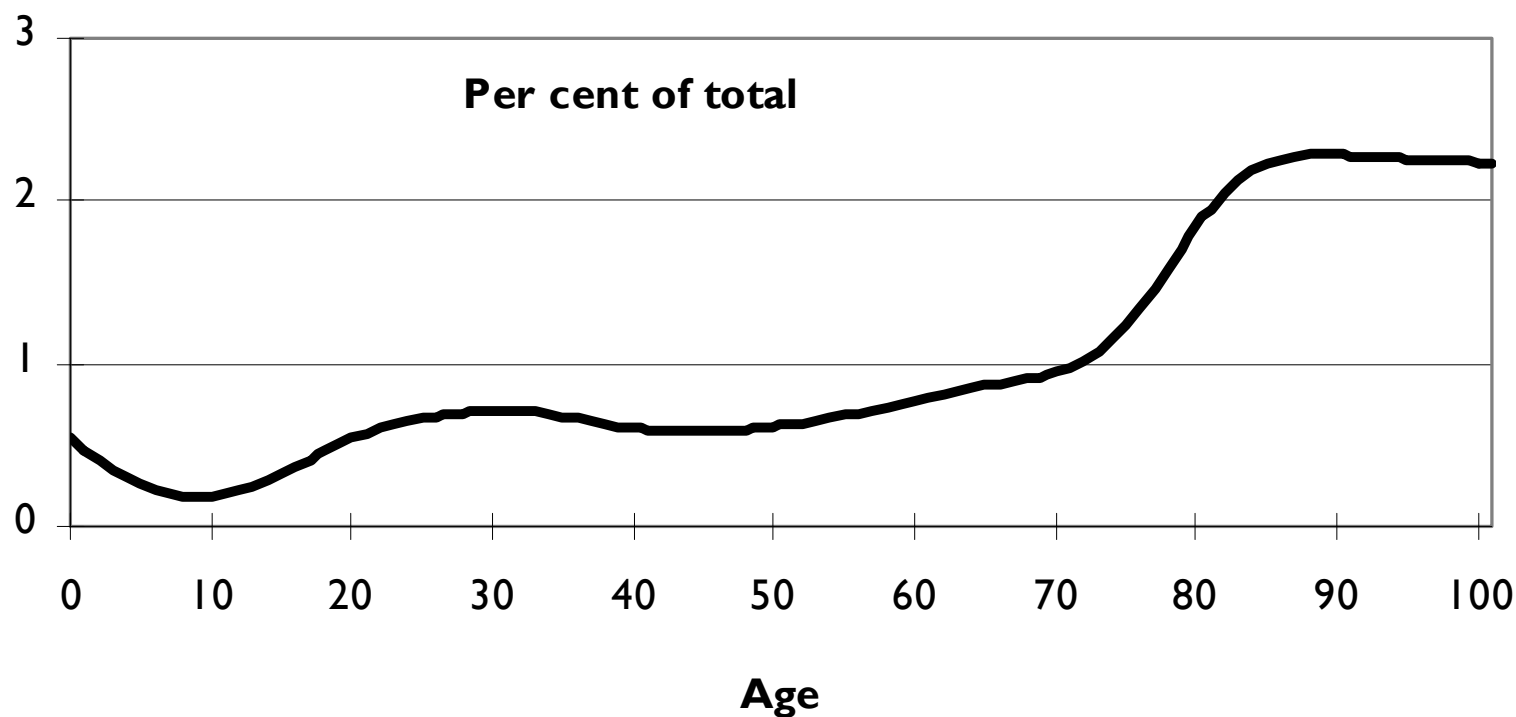




# Age-profile: Education

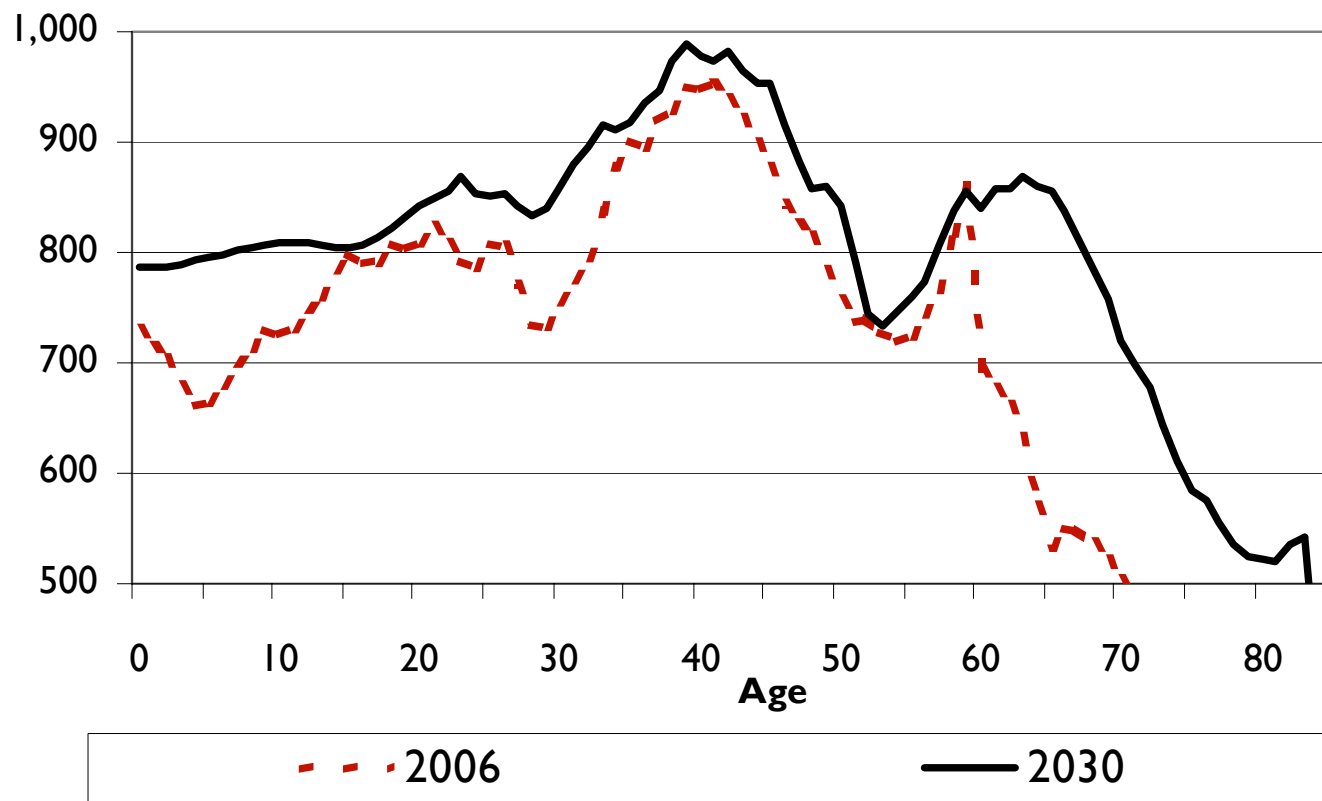


# Age-profile: Health (females)



# Population projection 2030

Population age-structure ('000)



Source: Office for National Statistics



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# Projecting Spending and Revenues (II): Assumptions

- Current policy and behaviours
- Constant per capita revenue and spending (e.g. technology)
- No cohort effects
- Demand side only



# Results

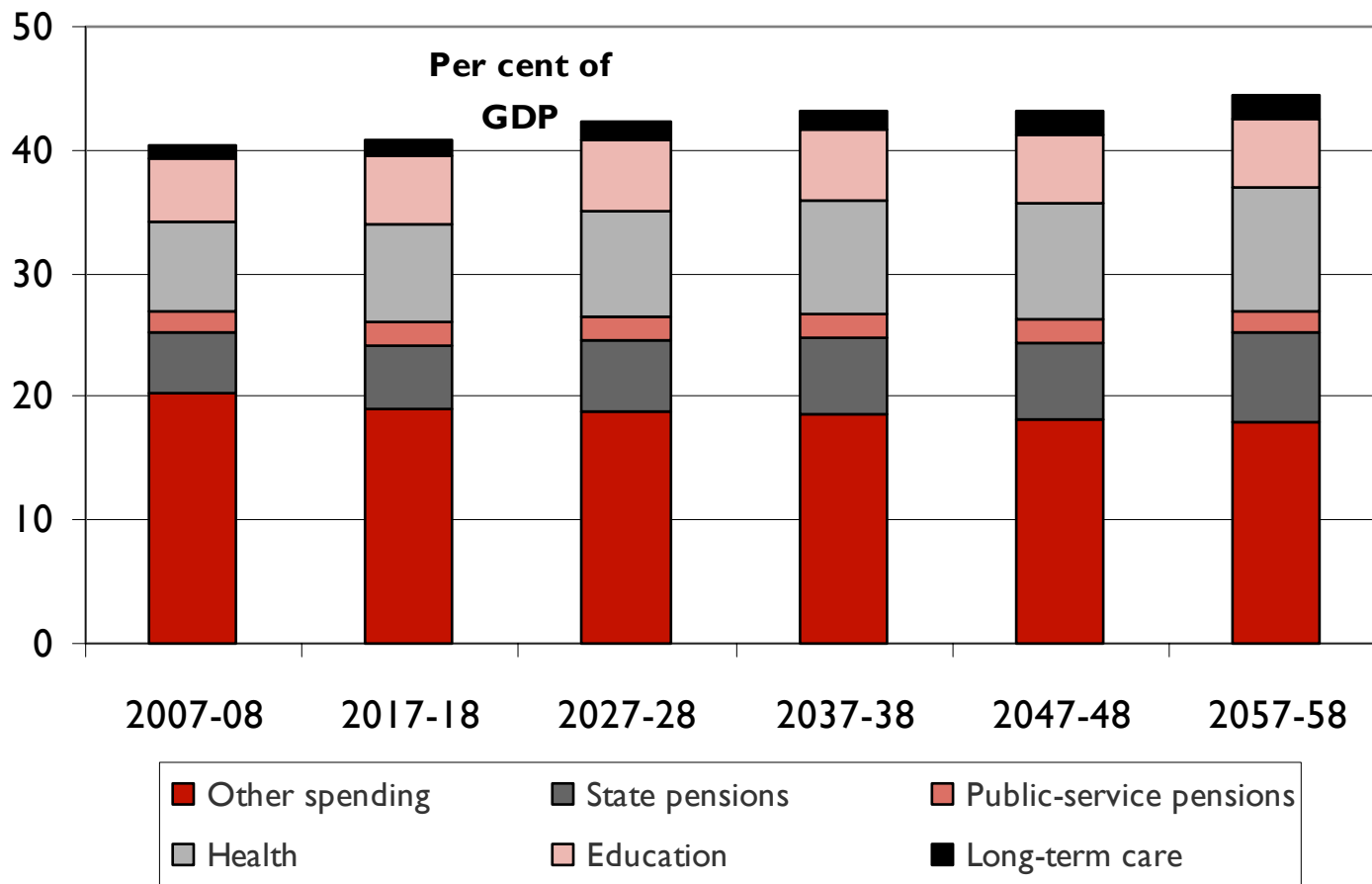
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- Spending and revenue projections
- Assessing fiscal sustainability



# Spending Projections

## Baseline spending projections

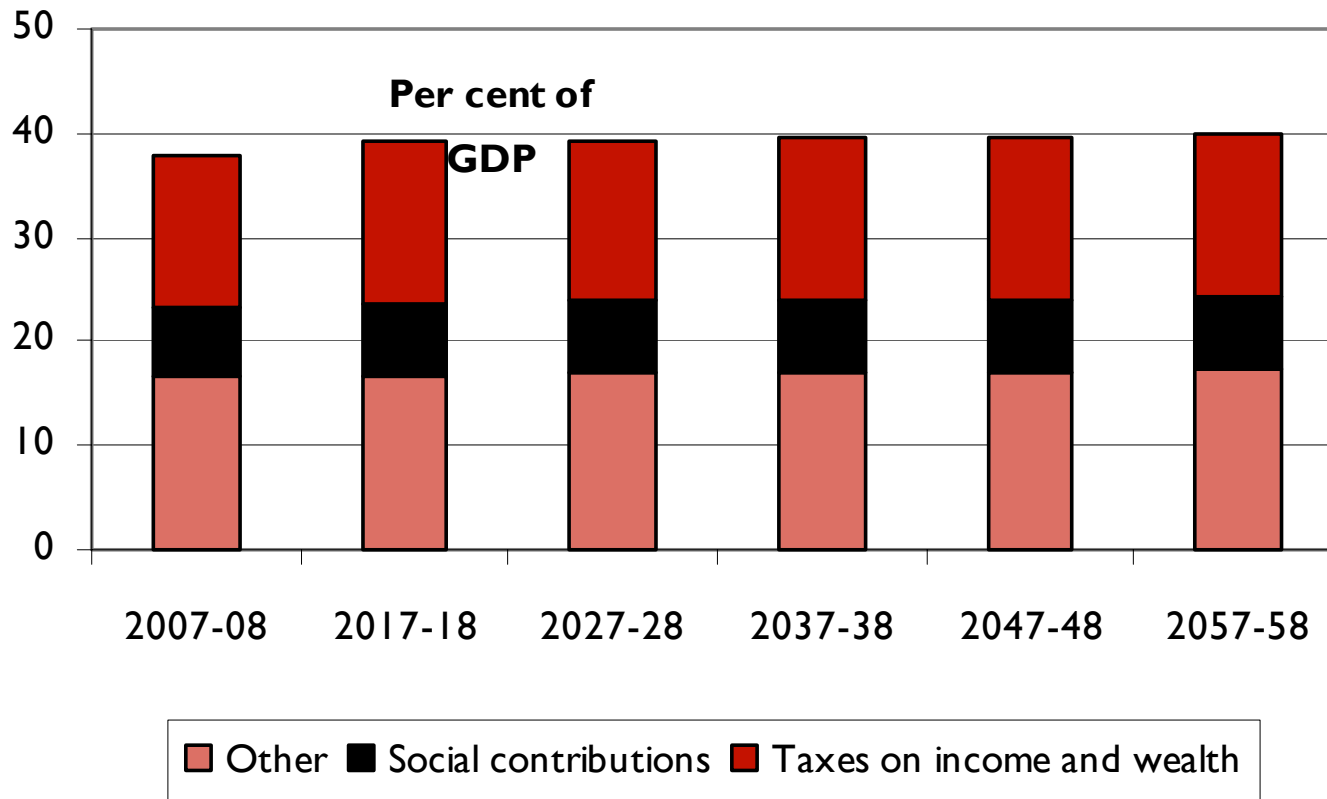


Total spending includes gross investment but excludes interest and dividends paid.



# Revenue Projections

## Baseline revenue projections

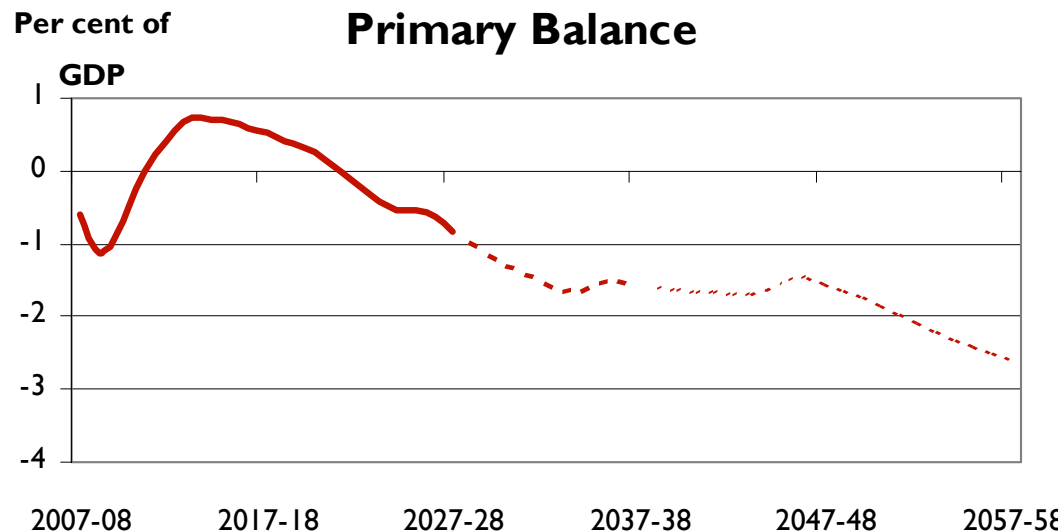


*Total receipts, excluding interest and dividends received.*



# Assessing Fiscal Sustainability

- Primary balance
- Forward looking indicators:
  - Intertemporal budget gap
  - Fiscal gap



Source: HM Treasury

### Fiscal gaps (per cent of GDP)

| Interest rate (per cent) | 2½   | 3    | 3½   |
|--------------------------|------|------|------|
| <b>Target year</b>       |      |      |      |
| 2027-28                  | 0.25 | 0.50 | 0.75 |
| 2037-38                  | 0.75 | 1.00 | 1.25 |
| 2047-48                  | 1.00 | 1.25 | 1.50 |
| 2057-58                  | 1.50 | 1.50 | 1.75 |





# Challenges

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- Defining current policy
- Modelling uncertainty
- Coverage of long-term challenges



# Defining current policy

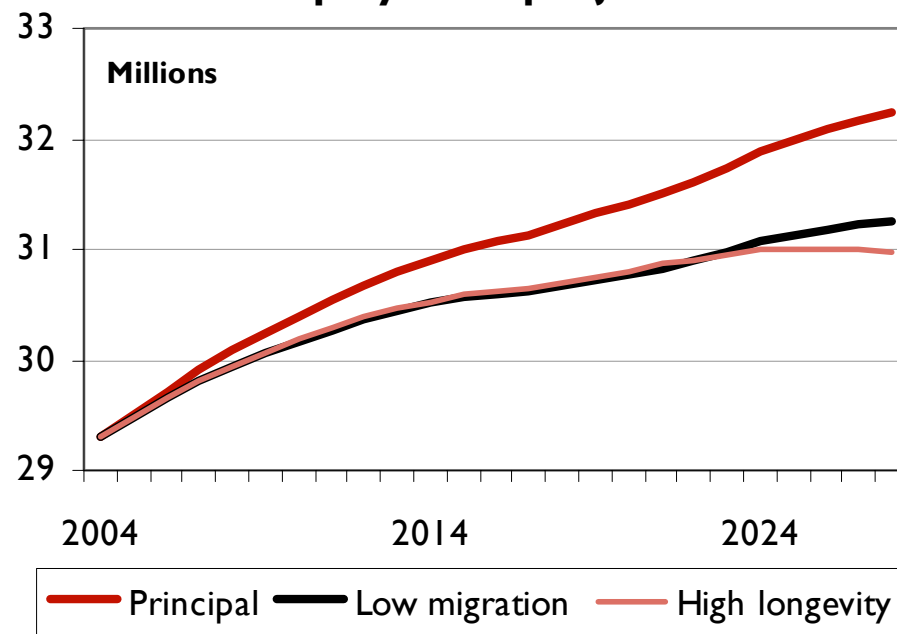
- Indexation
  - Taxation (Fiscal drag, proportion of GDP)
  - Benefits (e.g. pension/ unemployment versus disability)
- Government targets and aspirations
- Per capita spending
  - Technological change (health)
  - Supply side effects



# Modelling uncertainty

- Sensitivity analysis
  - Population variants
  - Productivity
  - Interest/Discount rate

UK employment projections



Spending projections (per cent of GDP) under variant population projections

|                | 2007-08 | 2017-18 | 2027-28 | 2037-38 | 2047-48 | 2057-58 |
|----------------|---------|---------|---------|---------|---------|---------|
| Baseline       | 40.5    | 40.7    | 42.1    | 42.8    | 42.3    | 43.3    |
| Low migration  | 40.5    | 40.8    | 42.5    | 43.7    | 43.7    | 45.1    |
| High longevity | 40.5    | 40.5    | 41.9    | 44.0    | 44.8    | 47.7    |



# Coverage of long-term challenges

- 2007 Comprehensive Spending Review – main long-term challenges for UK:
  - Demographic and socio-economic change;
  - Increasing pressures on natural resources and the global climate;
  - Intensification of cross-border economic competition; and
  - Continued global uncertainty from global market instability and ongoing threats from terrorism and conflict
- Current assessment of long-term public finances only accounts for demographic change



# Conclusion

- Projections show implications of current policy
  - Pressures on public finances in long-term
  - Distribution of spending and revenue between generations
- Current fiscal position: UK well placed to deal with fiscal challenges arising from demographic change over the coming decades and therefore in good position to deal with potential fiscal impacts arising from other long-term trends.
- BUT given likely changes in behaviours, uncertainty and other long-term trends => **only an illustration**



# Who knows...

