Long-term Public Finance Projections

Kerstin Greb, Tom Pybus, Shaun Butcher

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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)

• **Results**
  – Spending and Revenue Projections
  – Assessing fiscal sustainability

• **Challenges**
  – Defining current policy
  – Modelling uncertainty
  – Coverage of long-term challenges

• **Conclusion**
Background

- 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

[Graph: Demographic old-age dependency ratio]
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

- Population and employment
- GDP projections
- Projecting public spending and revenues
Population

- ONS population projections
- Uncertainty – population variants

<table>
<thead>
<tr>
<th></th>
<th>Principal</th>
<th>Low population</th>
<th>Low life expectancy</th>
<th>Old</th>
<th>Low migration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertility rate¹</td>
<td>1.84</td>
<td>1.64</td>
<td>1.84</td>
<td>1.64</td>
<td>1.84</td>
</tr>
<tr>
<td>Life expectancy at birth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>82.7</td>
<td>80.7</td>
<td>80.7</td>
<td>84.7</td>
<td>82.7</td>
</tr>
<tr>
<td>Females</td>
<td>86.2</td>
<td>84.9</td>
<td>84.9</td>
<td>87.5</td>
<td>86.2</td>
</tr>
<tr>
<td>Long-term average annual net migration</td>
<td>190,000</td>
<td>130,000</td>
<td>190,000</td>
<td>130,000</td>
<td>130,000</td>
</tr>
</tbody>
</table>

¹ Long-term average number of children per woman.

Employment (I)

- 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

UK employment projections

- Principal
- Low migration

Millions

2004 2014 2024
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:

<table>
<thead>
<tr>
<th>Year</th>
<th>2017-18 to 2026-27</th>
<th>2027-28 to 2036-37</th>
<th>2037-38 to 2046-47</th>
<th>2047-48 to 2056-57</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Employment</td>
<td>0.25</td>
<td>0.25</td>
<td>0.5</td>
<td>0.25</td>
</tr>
<tr>
<td>Real GDP</td>
<td>2.25</td>
<td>2.25</td>
<td>2.5</td>
<td>2.25</td>
</tr>
</tbody>
</table>
Projecting Spending and Revenues (I): Methodology

• 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

Per cent of total

Age

Full time
Part time
Age-profile: Health (females)
Population projection 2030

Population age-structure ('000)

Source: Office for National Statistics
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

• Spending and revenue projections
• Assessing fiscal sustainability
Baseline spending projections

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

*Baseline revenue projections*

![Chart showing revenue projections as a percentage of GDP from 2007-08 to 2057-58, with categories for other, social contributions, and taxes on income and wealth.]

*Total receipts, excluding interest and dividends received.*
Assessing Fiscal Sustainability

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

Fiscal gaps (per cent of GDP)

<table>
<thead>
<tr>
<th>Interest rate (per cent)</th>
<th>2½</th>
<th>3</th>
<th>3½</th>
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</thead>
<tbody>
<tr>
<td>Target year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2027-28</td>
<td>0.25</td>
<td>0.50</td>
<td>0.75</td>
</tr>
<tr>
<td>2037-38</td>
<td>0.75</td>
<td>1.00</td>
<td>1.25</td>
</tr>
<tr>
<td>2047-48</td>
<td>1.00</td>
<td>1.25</td>
<td>1.50</td>
</tr>
<tr>
<td>2057-58</td>
<td>1.50</td>
<td>1.50</td>
<td>1.75</td>
</tr>
</tbody>
</table>

Source: HM Treasury
Challenges

• 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

| 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    |

UK employment projections

- Principal
- Low migration
- High longevity
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…

- Queen Victoria dies (1901)
- Antibiotics (1928)
- 1st Personal computer (1976)
- "Dolly" the sheep was cloned (1996)
- First flight (1903)
- Second World War (1945)
- Berlin wall falls (1989)
- 9/11 Terrorist Attacks (2001)
- Baby boomers retire (2030s)

1900 -> 2008 -> 2100