

Long-term public finance report: an analysis of fiscal sustainability

December 2006



HM TREASURY



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**Long-term
public finance report:
an analysis of fiscal
sustainability**

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OVERVIEW

INTRODUCTION

I.1 Since 2002 the Government has published the Long-term public finance report on an annual basis, with the intention of providing a comprehensive analysis of long-term socio-economic and demographic developments, and their likely impact on the public finances. The Long-term public finance report complements the illustrative long-term fiscal projections presented in the Economic and Fiscal Strategy Report (EFSR),¹ published at the time of the Budget. The Government is committed to updating and reporting regularly on its assessments of long-term fiscal sustainability, both through the Long-term public finance report and through the illustrative long-term fiscal projections presented with each Budget.

Motivation for the Report

I.2 The publication of the Long-term public finance report is motivated by the Government's belief that sustainable public finances are a prerequisite to achieving high and stable rates of long-term economic growth, which are shared by all, and to ensuring that spending and taxation impact fairly between generations. It is therefore important for the Government to have a good understanding of potential future social and economic trends, and the fiscal implications of current policy for future generations. A better understanding of these trends also assists the Government in making strategic policy decisions, including those that will shape the outcome of the 2007 Comprehensive Spending Review (CSR).²

I.3 Moreover, additional information on long-term fiscal trends – particularly when updated on a regular basis – greatly improves fiscal transparency and credibility. The Government also hopes that this publication and its recently published analysis for the 2007 CSR on long-term opportunities and challenges will help to stimulate a public discussion on issues and choices facing individuals, businesses, communities and government as the UK responds to a profound change in the decade ahead and beyond.³

Long-term challenges

I.4 This Report focuses on long-term demographic changes and their implications for fiscal sustainability. It explains how one of the key challenges that all developed economies are facing over the coming decades is the ageing of their populations. The ageing trend is mainly driven by increases in longevity (life expectancy) and continuing low fertility rates (the number of children per woman). In many developed countries these factors are also predicted to lead to a decline in the size of the working-age population. At the same time, the populations of working age in many less-developed countries are predicted to increase. It is likely that these global demographic trends will affect future capital flows and the location of economic activity.

I.5 These trends are likely to have profound effects on Britain's society and economy over the coming decades. Even though the UK population is projected to age less rapidly than those of many other developed countries (and hence the associated challenges should be less marked), a thorough understanding of the demographic and other likely long-term trends⁴ is essential for the Government to make the right long-term strategic policy decisions and to

¹ Annex A of the Economic and Fiscal Strategy Report, in *Budget 2006: A strong and strengthening economy: Investing in Britain's future*, HM Treasury, March 2006.

² In July 2005 the Government announced that the 2007 Comprehensive Spending Review would look at domestic and international trends, which might unfold over the longer term. See *Written statement to Parliament on the Spending Review*, HM Treasury, July 2005. Also see *Long-term opportunities and challenges for the UK: analysis for the 2007 Comprehensive Spending Review*, HM Treasury, November 2006.

³ *Ibid.*

⁴ See Chapter 2 for a discussion of the longer-term trends that have been identified by the Government as important for the 2007 Comprehensive Spending Review.

ensure that government policy will be fiscally sustainable in the long term. Without this type of analysis there is a risk that fiscally unsustainable policies might be pursued, which require sharp corrective policy adjustments in the future. Such sudden and unexpected changes in policy could be very harmful and unfair towards firms and individuals.

1.6 The 2006 *Long-term public finance report* follows the general structure developed in previous reports. On the basis of an updated assessment, which takes account of the latest medium-term public finance projections published in the 2006 Pre-Budget Report⁵ and policy developments,⁶ the 2006 Report finds that the UK's long-term fiscal position remains sustainable. The Report also concludes that the UK is well placed relative to many other developed countries to deal with the fiscal challenges arising from ageing populations in the future.

THE UK FISCAL FRAMEWORK

1.7 The UK's fiscal framework is central to achieving the Government's objective of high and stable long-term economic growth. The framework facilitates transparent, long-term decision-making in both the public and private sectors. According to the International Monetary Fund (IMF): "...the fiscal framework is at the forefront of international best practice".⁷

1.8 The fiscal framework is guided by the *Code for Fiscal Stability*,⁸ which sets out a commitment to managing the public finances in the long-term interests of Britain. The five key principles of the *Code* – transparency, stability, responsibility, fairness and efficiency – also support a long-term focus in the policy-making process.

Objectives for fiscal policy

1.9 Fiscal policy is set with consideration for the short, medium and long terms. The *Code* requires the Government to state its objectives and the fiscal rules by which fiscal policy is operated. The Government's objectives for fiscal policy are:

- over the medium term, to ensure sound public finances and that spending and taxation impact fairly both within and between generations; and
- over the short term, to support monetary policy; and, in particular, to allow the automatic stabilisers to help smooth the path of the economy.

1.10 In the long run, fiscal policy supports the Government's long-term goals by ensuring that the public finances are sustainable, contributing to a stable environment that promotes economic growth. This environment is important for achieving the Government's objective of building a stronger, more enterprising economy and a fairer society, extending economic opportunity and supporting those most in need to ensure that rising national prosperity is shared by all.

⁵ 2006 *Pre-Budget Report*, HM Treasury, December 2006.

⁶ The analysis in this Report takes into account the policies proposed in the Government's White Paper on pensions. See *Security in Retirement: towards a new pensions system*, Department for Work and Pensions, May 2006.

⁷ *United Kingdom: 2005 Article IV Consultation - Staff Report; Public Information Notice on the Executive Board Discussion; and Statement by the Executive Director for the United Kingdom*, International Monetary Fund, March 2006, page 19.

⁸ *Code for Fiscal Stability*, HM Treasury, March 1998.

Fiscal rules I.11 The Government has formulated two fiscal rules through which the objectives for fiscal policy are implemented, which also reflect the commitments to fiscal sustainability and generational fairness. They are:

- **the golden rule:** over the economic cycle, the Government will borrow only to invest and not to fund current spending; and
- **the sustainable investment rule:** public sector net debt as a proportion of GDP will be held over the economic cycle at a stable and prudent level. Other things being equal, net debt will be maintained below 40 per cent of GDP over the economic cycle.

I.12 The golden rule specifies that current spending should be financed by current taxes over the economic cycle, thus ensuring generational fairness and fiscal sustainability. In addition, the sustainable investment rule ensures debt sustainability and also supports generational fairness by limiting the scope for the current generation to leave excessive debt burdens to future generations.

PURPOSE AND STRUCTURE OF THIS REPORT

I.13 The *Code* also requires the Government to publish illustrative long-term fiscal projections, covering a horizon of at least ten years. The projections, which are published in Annex A of the EFSR have in practice covered a 30-year horizon but, due to their methodology, do not identify specific long-term spending trends. This Report extends and complements the analysis in the EFSR, and aims to provide a comprehensive picture of the sustainability of the public finances over the long term based on a range of plausible assumptions. In addition, it offers better quality information to guide policy and enhance the decision-making and planning by both the Government and individuals, and establishes a framework for examining the effects of demographic change and other long-term trends on the public finances.

Uncertainties I.14 When analysing the results presented in this Report, it is important to remember the uncertainties involved in any long-term modelling exercise of this kind. Many factors will affect future trends in the public finances, including technological advances, international developments and socio-economic changes. These factors are often of a complex and nonlinear nature and are therefore difficult to predict accurately. The results presented in Chapter 5 should therefore be seen as indicative.

Structure

Long-term challenges I.15 To assess the long-term sustainability of the public finances, it is necessary to look at expected future trends. Chapter 2 focuses on the key long-term demographic trends that might affect the sustainability of the public finances. It examines in particular the ageing of the population. In addition, the chapter also discusses past and future trends in average family size. These are just some of the long-term challenges facing the UK. The Government's more comprehensive analysis of future trends can be found in *Long-term opportunities and challenges for the UK: analysis for the 2007 CSR*.

Comprehensive assessment of sustainability I.16 This year's Report uses approaches to assessing long-term fiscal sustainability, which have been used in previous reports. These approaches are: net debt, intertemporal budget constraint/gap, fiscal gaps and an indicative estimate of accruals-based net liabilities. These are discussed in Chapter 3.

Refined employment model I.17 Chapter 4 discusses the assumptions used in this Report. Projecting future GDP growth, for example, requires assumptions about future labour-market trends and productivity growth. This year's Report uses an updated and refined model (using the so-called 'cohort' method) to project future employment trends, which also takes account of the proposed changes in the State Pension age announced in the Government's White Paper *Security in retirement: towards a new pensions system*.¹⁰ As in previous years, the Report presents results based on three different productivity growth rate assumptions to provide some sensitivity analysis.

Updated age-profiles I.18 Chapter 4 also discusses the methodology used to project future spending and revenue trends. These projections require gender- and age-specific profiles for nearly 80 different spending and revenue items. These profiles have been updated comprehensively for this year's Report. In addition, the methodology to project health care spending has been refined to take advantage of new data becoming available.

Updated projections and assessment of sustainability I.19 Using the latest medium-term public finance projections, as published in the 2006 Pre-Budget Report, Chapter 5 presents updated long-term fiscal projections and compares them with those published in last year's *Long-term public finance report*. Age-related spending, as a share of GDP, is projected to be similar by the mid 2050s to that projected in last year's Report. The information on net debt and the forward-looking indicators is complemented by indicative balance-sheet data, which provide an illustration of the trends in the Government's net liabilities. Updated international comparisons show that the UK, based on current policies, remains in a relatively strong position to deal with the fiscal challenges arising from an ageing population.

⁸ Code for Fiscal Stability, HM Treasury, March 1998.

INTRODUCTION

2.1 This chapter presents potential long-term socio-economic trends. The main focus, as in previous Long-term public finance reports, is on demographic changes in general and population ageing in particular. The long-term demographic trends presented in this chapter are based on the Government Actuary's Department's (GAD's) 2004-based population projections, produced in October 2005, which are the latest projections available. These projections were also used for the purposes of last year's Report.¹

2.2 Population ageing is not the only socio-economic trend that is likely to occur over the coming decades. Previous Long-term public finance reports have looked at other potential trends, including:

- differences in projected population growth between countries of the United Kingdom;² and
- demand for health and long-term care services, which will depend to a certain degree on the evolution of morbidity. In combination with future supply drivers such as technological and medical advances, these will influence future health spending.³

2.3 Given the time horizons, there is inevitably a very high degree of uncertainty involved in predicting trends. History tells us that change is often rapid and abrupt rather than gradual. Few people in the mid 1980s, for example, would have imagined that the Soviet Union would disintegrate by the late 1980s, and that central and eastern European countries would join the European Union in 2004. In addition to the discussion of population ageing, which is an underlying trend and therefore relatively certain, this chapter also provides some suggestions about how to deal with more uncertain trends.

THE CHANGING STRUCTURE OF THE UK POPULATION

2004-based population projections

2.4 One of the most important future developments is the changing structure of the UK's population. Up to 2005, GAD was the producer of official population projections for the UK. This responsibility moved to the Office for National Statistics (ONS) on 31 January 2006, which intends to issue the next full set of population projections in October 2007.⁴ GAD published its latest principal population projections, the 2004-based projections, in October 2005.⁵ Table 2.1 summarises GAD's main long-term assumptions for the principal and high variant population projections.⁶

¹ See *2005 Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, December 2005, pages 5 to 19.

² *Ibid*, page 10.

³ *2004 Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, December 2004, pages 17 to 19.

⁴ See *2004-based national population projections for the UK and constituent countries*, Chris Shaw, *Population Trends No. 123*, Office for National Statistics, Spring 2006, page 9.

⁵ <http://www.gad.gov.uk/Population/index.asp>.

⁶ GAD also produces low and other variants. These are not shown in Table 2.1.

Table 2.1: Assumptions for principal and high variant population projections

	Principal	High Fertility	High Longevity	High Migration
Fertility rate ¹	1.74	1.94	1.74	1.74
Life expectancy at birth (years) in 2031				
Males	81.4	81.4	83.5	81.4
Females	85.0	85.0	86.5	85.0
Long-term annual net migration ²	145,000	145,000	145,000	205,000

¹ Long-term average number of children per woman.

² From 2007-2008 onwards.

Source: Government Actuary's Department, 2004-based population projections.

Assumptions and uncertainty

2.5 Population projections are subject to substantial uncertainty, and are highly sensitive to the underlying assumptions used. Even small changes can make a significant difference to the outcome in the long term. Furthermore, a number of these assumptions have been revised as new information has become available. The 2001-based principal population projections, for example, assumed life expectancy at birth for a male in 2031 to be 79.3 years. For the purposes of the 2004-based projections, this assumption has been revised upwards to 81.4 years, reflecting new information and a change in the approach used to project mortality rates.⁷ Similarly, the net migration assumption was revised upwards by 15,000 persons between the 2003-based and 2004-based principal population projections. The 2005 *Long-term public finance report* provides a more detailed discussion of these revisions, and describes how they have affected projections of the population.⁸

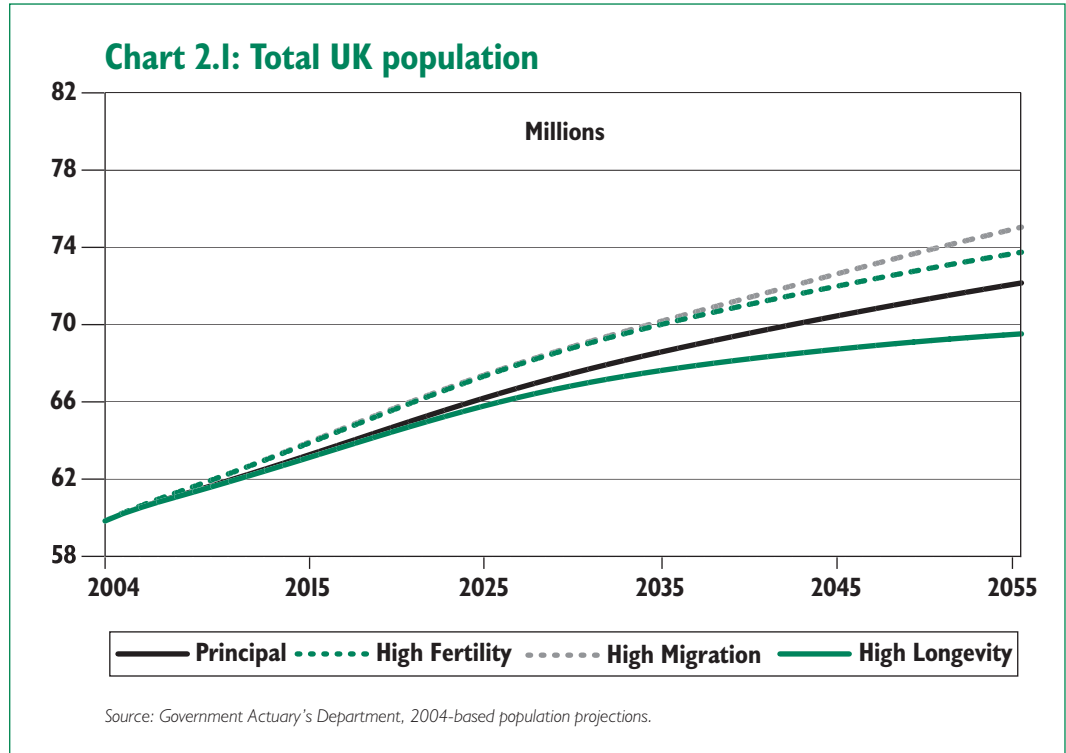
Total population projected to increase

2.6 According to the latest principal population projections, the UK's population will increase from 59.8 million in 2004 to around 69.5 million by 2055.⁹ With the fertility rate assumed to remain below the replacement rate of 2.1 children per woman (the rate which is necessary to stabilise the population size naturally), the increase in the total population is due to the assumption that life expectancy will improve at a constant rate year-on-year, and due also to assumed long-term net migration of 145,000 people per year. Migration estimates are subject to a high degree of uncertainty, which is why GAD publishes high and low variants. Net migration levels for both 2004 and 2005 have been above GAD's principal projection and close to its high variant projection. The total population size is projected to increase by more in GAD's high population variants, and by the most in the high fertility variant. The high longevity assumption makes the smallest difference. Chart 2.1 shows the projected evolution of the total population size in the different high variants.

⁷ For more information on the revision to the mortality assumption, see 2005 *Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, December 2005, page 13.

⁸ *Ibid*, page 11.

⁹ In comparing future population trends with 'current' population levels, values for 2004, rather than later years, are presented here. This is because GAD's 2004-based population projections present recorded population values for 2004, while the values for 2005 and 2006 are projected population levels based on the assumptions described above.



2.7 Future population trends are projected to vary significantly by country of the UK. For example, GAD projects an increase in the population of England of nearly 20 per cent between 2004 and 2055, in contrast to a projected increase of around 12 per cent for Wales and just over 5 per cent for Northern Ireland. The population of Scotland is projected to decline by nearly 8 per cent over the same period.¹⁰

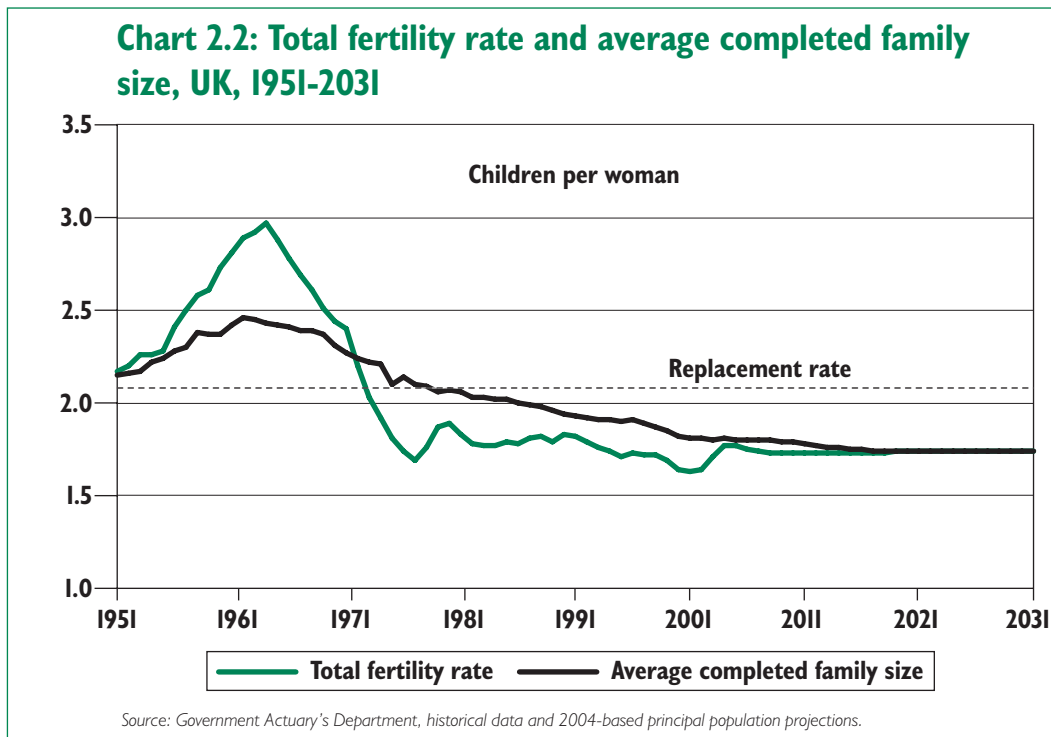
Drivers of population growth

2.8 According to the Office for National Statistics, the number of children aged 15 and under has fallen by around 3 per cent since 1995, having risen by around 2½ per cent between 1985 and 1995. One of the factors contributing to this recent decrease is the general decline in the fertility rate that occurred during the 1990s (see Chart 2.2). Similarly, the average completed family size (CFS) has also fallen over the past three decades, and is projected to converge to an assumed long-term fertility rate of 1.74 by around 2017.¹¹ Chart 2.2 shows that this is below the fertility rate necessary to stabilise the aggregate population level in the absence of migration (the 'replacement rate').¹² As a result, positive net inward migration is projected to be the sole driver of population growth from 2034 onwards. This contrasts with trends observed over the past 20 years, when natural change (the number of births minus the number of deaths) has made a significant positive contribution to annual population growth.

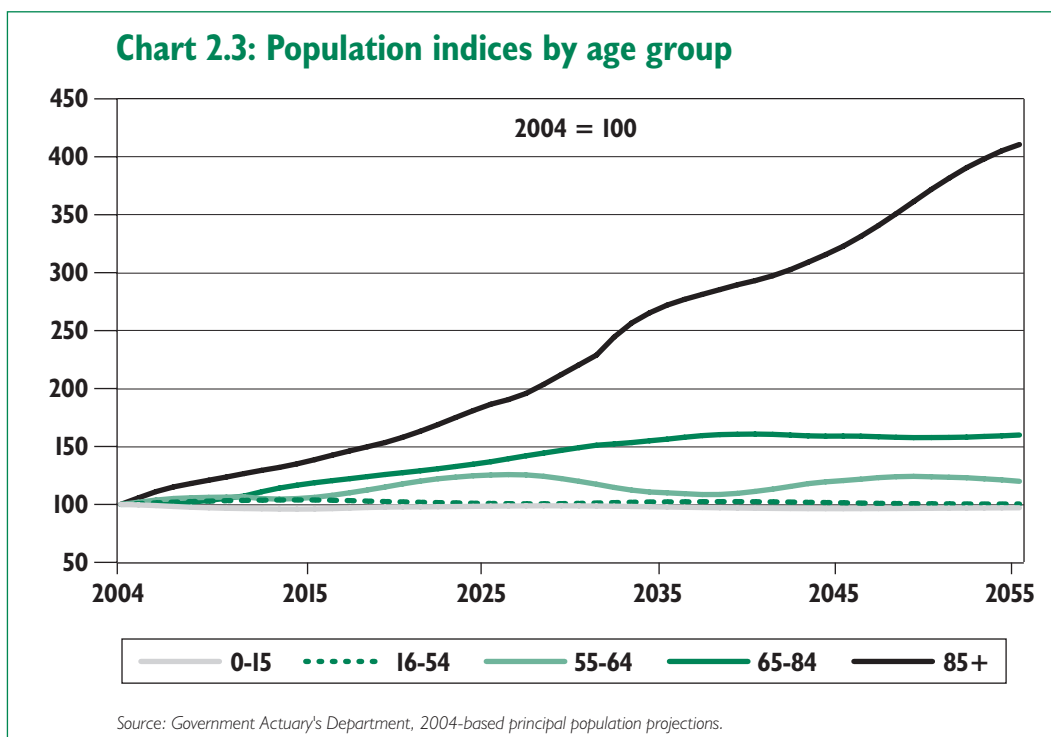
¹⁰ See 2005 *Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, December 2005, page 10, for more details.

¹¹ Note that total fertility rates and average completed family size may diverge in the short term as individuals in aggregate may choose to 'compress' or 'spread out' births across their lifetimes. For example, if the population compresses the number of births at one point in time, then the fertility rate will temporarily be higher than the average completed family size (as in the early 1960s).

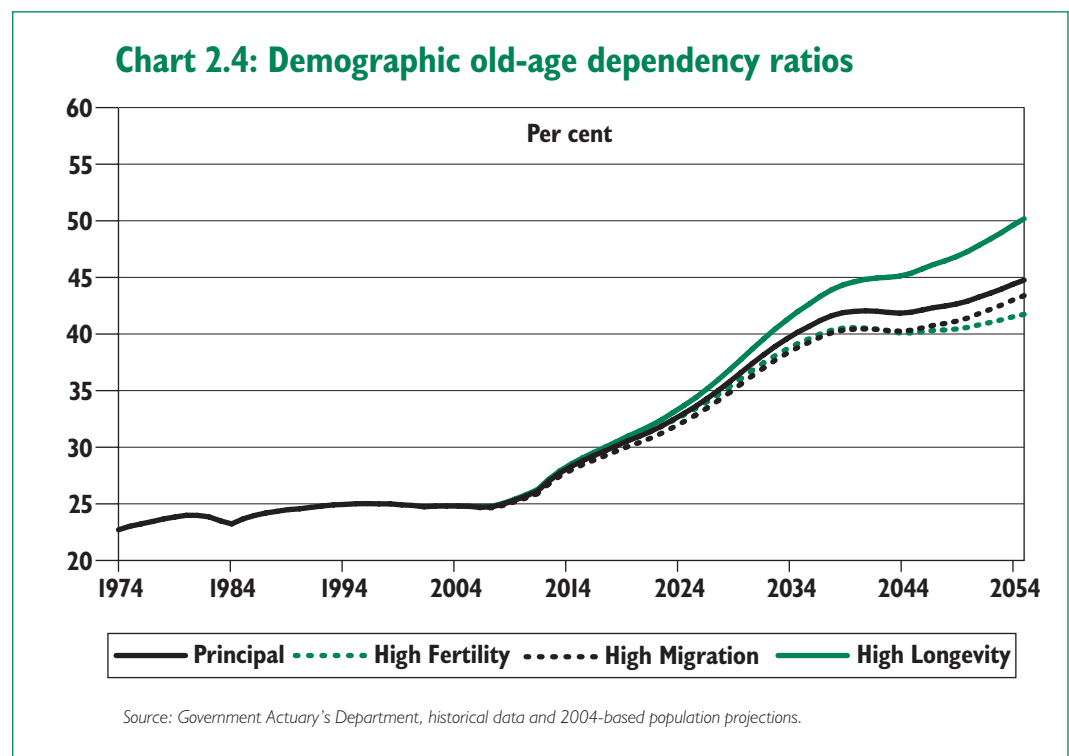
¹² A number of other developed countries currently observe a total fertility rate closer to the common replacement rate (2.1) than the UK. These include the US (2.09) Ireland (1.86) and France (1.84).



An ageing population 2.9 In addition to the projected rise in the number of people living in the UK, GAD's projections also show a marked change in the composition of the population over the coming decades, with the share of older people in the total population rising gradually. As shown in Chart 2.1 above, the total population is projected to rise by over 15 per cent over the next 50 years in the principal case. However, this overall increase masks wide variations between the growth rates of different age groups. Chart 2.3 shows that the younger working-age population and the number of children are projected to remain relatively stable over the period, while the 55-64 year olds show a rise of nearly a quarter by 2055. This contrasts with large projected increases for the older age-groups: the 65-84 year olds will have grown by more than half, and the 85+ group will have quadrupled by the end of the period.



2.10 The effect of the changes in the age structure of the population can be illustrated by the evolution of the demographic old-age dependency ratio. This ratio shows the number of people aged 65 years and over relative to the number of people aged 16 to 64 years. As can be seen from Chart 2.4 the demographic old-age dependency ratio has edged up slightly since the early 1970s, reaching around 25 per cent in the mid 1990s. The ageing process is expected to accelerate significantly after 2010, with the ratio projected to rise to 42 per cent by 2040 and then 45 per cent by the mid 2050s in the principal projections. In the high longevity variant, the old-age dependency ratio is projected to reach over 50 per cent by 2054, due to the higher number of people aged 65 years and over. The ratio is projected to rise by slightly less in the high migration and high fertility variants than in the principal case. For the former, this reflects the fact that migrants are assumed to be mainly of working age. For the latter, this is because the size of the working-age population will be boosted by an inflow of more young people in the coming decades.

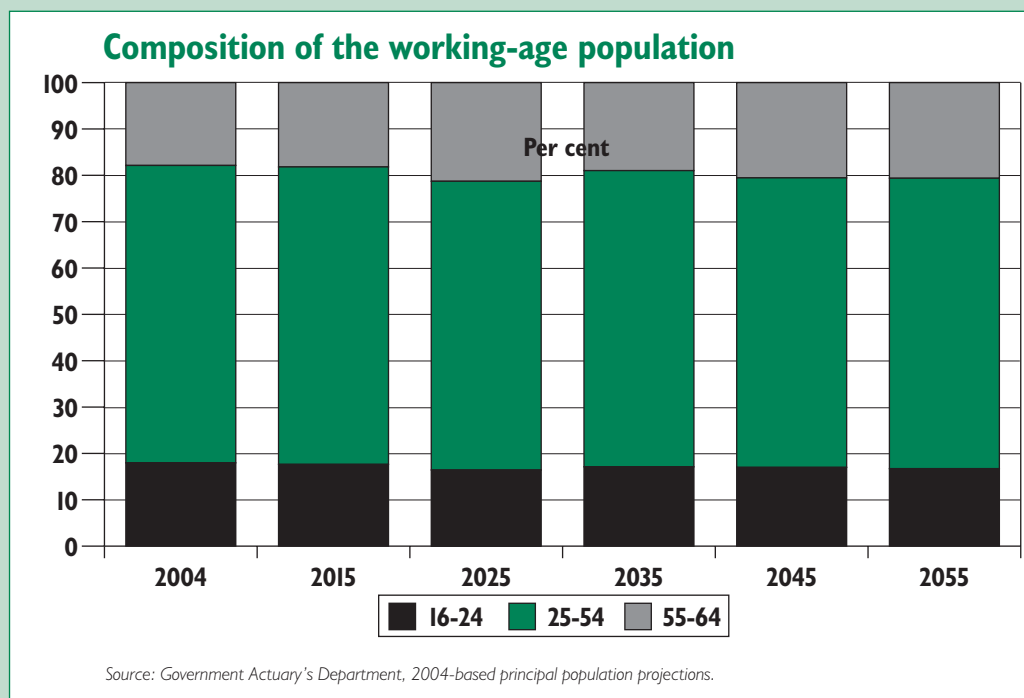


2.11 Projections of the demographic old-age dependency ratio are a useful way to assess the projected demographic shift from the working-age population to the population over the age of 65. However, they are of limited use in evaluating possible changes in the age composition of the working-age population itself, which are likely to have significant implications for future labour market trends. Box 2.1 provides more information on the projected age structure of the working-age population.

Box 2.1: The working-age population

The Government Actuary’s Department’s (GAD) 2004-based population projections suggest that the population of ‘working age’ (defined here as all those aged 16 to 64 years) is likely to grow at a much slower rate than the population of those aged 65 years and over between 2004 and 2055 (see Chart 2.3). However, in considering the impact of demographic change upon economic growth, it is also important to take into account projected shifts in the age composition of the working-age population, not least because a number of studies suggest age has an impact upon productivity.^a

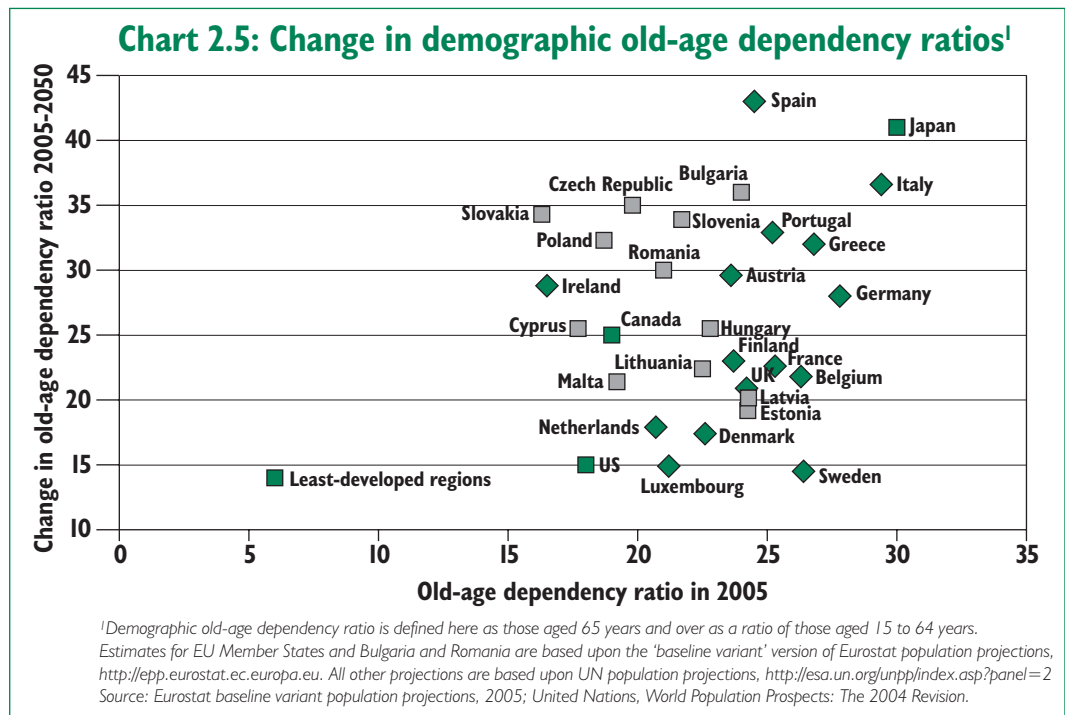
The chart below shows that the composition of the working-age population (by broad age group) is projected to remain relatively stable between 2004 and 2055. For example, the proportion of the working-age population aged 25 to 54 years (the main age group for the labour market) is projected to remain between 62 and 64 per cent throughout the entire period. Similarly, the population aged 55 to 64 years, as a proportion of the population of working age, is projected to vary by only 3 percentage points over the period up to 2055. This suggests that the impact of demographic change upon aggregate productivity growth is likely to be limited, as the projected ageing of the population is mainly driven by changes in the size and composition of the population over 65 years. Chapter 4 provides more details of the productivity assumptions used in this Report.



^a See 2004 Long-term public finance report: an analysis of fiscal sustainability, HM Treasury, December 2004, page 16, for a more detailed discussion of the relationship between age and productivity.

Ageing: a global phenomenon 2.12 The UK is not the only country with an ageing population; ageing is a trend seen in most developed countries. Chart 2.5 shows that a number of EU Member States are projected to observe an increase in the demographic old-age dependency ratio between 2005 and 2050 in excess of 30 percentage points. This includes four of the new Member States that joined the EU in 2004 (Czech Republic, Poland, Slovakia and Slovenia), as well as Bulgaria and Romania, who will join in 2007.

2.13 Similar trends are expected for most other developed countries. Chart 2.5 shows that Japan's population is projected to age significantly, with the old-age dependency ratio increasing by 41 percentage points between 2005 and 2050. By contrast, the US population is projected to age relatively moderately. The chart also shows the projected change for 'least-developed' regions,¹³ illustrating that population ageing is not a phenomenon limited to developed countries. Many developing and middle-income countries will also experience substantial population ageing over the coming decades, albeit, in many cases, from a lower starting point. For example, the demographic old-age dependency ratio in India is projected to rise from 8 per cent in 2005 to 22 per cent by 2050.¹⁴



OTHER LONG-TERM TRENDS

2.14 In addition to the analysis set out in this Report, the Government has published *Long-term opportunities and challenges for the UK: analysis for the 2007 Comprehensive Spending Review*¹⁵ on 27 November 2006. That document looks in turn at five areas of change that the Government will have to confront in the decade ahead:

- demographic and socio-economic change, with rapid increases in the old-age dependency ratio on the horizon, and rising consumer expectations of public services;
- the intensification of cross-border economic competition, with new opportunities for growth, as the balance of international economic activity shifts toward emerging markets such as China and India;
- the rapid pace of innovation and technological diffusion, which will continue to transform the way people live and open up of new ways of delivering public services;

¹³ As defined by the United Nations. See <http://esa.un.org/unpp/definition.html>.

¹⁴ For a study on the likely consequences of an ageing population in China on the country's pension system, see *The Graying of the Middle Kingdom*, Richard Jackson and Neil Howe, April 2004. For an analysis of the ageing challenge in Mexico, see *Building Human Capital in an Aging Mexico: A report of the U.S.-Mexico binational council*, Richard Jackson, July 2005.

¹⁵ *Long-term opportunities and challenges for the UK: analysis for the 2007 Comprehensive Spending Review*, HM Treasury, November 2006.

- continued global uncertainty with ongoing threats of international terrorism and conflict and the continued imperative to tackle global poverty; and
- increasing pressures on our natural resources and global climate, requiring action by governments, businesses, and individuals to maintain prosperity and improve environmental care.

2.15 It explains how the Government will use the CSR as a key milestone in making further progress against its established long-term goals of sustainable growth and employment; fairness and opportunity; a secure and fair world; and modern and efficient public services in the new context facing the UK.

2.16 The CSR will be informed by a series of policy reviews to identify the cross-departmental actions and reforms necessary to seize opportunities and meet the challenges in the decade ahead. These reviews are set out in detail in *Long-term opportunities and challenges for the UK: analysis for the 2007 Comprehensive Spending Review*.¹⁶ Box 2.2 provides more details of the *Stern Review on the Economics of Climate Change*,¹⁷ which was published on 30 October 2006.

¹⁶ *Long-term opportunities and challenges for the UK: analysis for the 2007 Comprehensive Spending Review*, HM Treasury, November 2006.

¹⁷ *Stern Review on the Economics of Climate Change*, Sir Nicholas Stern, October 2006, available at <http://www.sternreview.org.uk>.

Box 2.2 The Stern Review on the Economics of Climate Change

On 30 October 2006, the Stern Review on the Economics of Climate Change published its findings.^a This Review, which was commissioned by the Chancellor in July 2005, seeks to develop a detailed understanding of the long-term economic challenges posed by climate change and how they can best be met – both within the UK and internationally. In particular, the Review finds that:

- unabated climate change risks raising average temperatures by over 5° C from pre-industrial levels. This is equivalent to the difference in temperature between now and the last Ice Age, and entails very significant risks of severe impacts;
- while all countries will be affected by climate change, it is the poorest countries that will suffer earliest and by most; and
- considering the more recent scientific evidence on the risks of high temperatures, the full effects beyond those which are directly measurable, and the need to weight the impact upon poor people appropriately leads to a conclusion that damages could be very significant economically. Modelling estimates indicate that they could be in the order of 5 per cent to 20 per cent of global consumption.

However, the Review also notes that the costs of action to tackle climate change are likely to be small relative to the dangers of unabated climate change. Specifically, the Review notes that:

- provided action is taken early and with flexibility to exploit low-cost options across the world, the costs of action to reduce greenhouse gas emissions and avoid the worst impacts of climate change can be limited to around 1 per cent of global GDP each year; and
- the shift to a low-carbon economy will also bring huge opportunities. Markets for low-carbon technologies will be at worth at least \$500 billion, and perhaps much more, by 2050 if the world acts on the scale required, and climate change policies could make a significant contribution to other policy goals, including reduced air pollution and greater energy security.

The Review concludes that: “There is still time to avoid the worst impacts of climate change, if we take strong action now”.^b This conclusion reiterates the need for a well-informed understanding of the nature of the problem and of its solutions; without such a shared understanding at a global level, there is a risk that sharp corrective policy adjustments may be required in the future, the costs of which may be significantly higher than the costs of earlier action.

^a *Stern Review on the Economics of Climate Change*, Sir Nicholas Stern, October 2006, available at <http://www.sternreview.org.uk>.

^b *Ibid*, ‘Summary of conclusions’.

DEALING WITH UNCERTAINTIES

2.17 One of the greatest challenges when assessing long-term trends is how to deal with the high degree of uncertainty surrounding them.¹⁸ While some trends are pre-determined and should therefore be relatively easy to predict, others are more difficult to quantify, and some are not expected to occur. And even those trends that fall into the first group still have a high degree of uncertainty attached to them;¹⁹ the future evolution of longevity is a case in point. The challenge is made bigger by the fact that future trends are not often merely linear extrapolations of past developments. As a result, dramatic changes can happen over a very short period of time.

2.18 While GAD's variant population projections provide a useful spectrum of how the UK population may evolve, they do not provide a formal quantification of the level of uncertainty associated with future demographic trends. The 'deterministic' approach used by GAD (and by most official population forecasters) to establish projections of the population does not attach probabilities to different projection variants.

Stochastic modelling

2.19 An alternative approach to projecting demographic trends is that of 'stochastic' modelling, in which the key vital parameters (fertility rates, mortality rates and migration flows) are shocked at random to establish projections of the population. This method allows for an explicit measurement of the uncertainty associated with predicting how the population will evolve, and can be used to attach probabilities to different realisations. For example, in a study conducted by the National Institute of Economic and Social Research (NIESR),²⁰ half of the stochastic simulations generated project the demographic old-age dependency ratio in the UK to be between 44 per cent and 54 per cent by 2052.²¹

2.20 However, even stochastic modelling cannot capture the potential interdependencies between the future paths of the underlying parameters. For example, it is highly likely that fertility rates would fall endogenously in the event that the population expands to very large levels. Many stochastic models do not incorporate these feedback mechanisms, and therefore do not provide a comprehensive indication of the uncertainty associated with the projections they generate.

¹⁸ The *Stern Review on the Economics of Climate Change* (see Box 2.2) draws attention to the uncertainty associated with projecting long-term trends by emphasising that "economic models over timescales of centuries do not offer precise forecasts – but they are an important way to illustrate the scale of effects we might see". See *Press notice: Publication of the Stern Review on the Economics of Climate Change*, HM Treasury, available at <http://www.hm-treasury.gov.uk/newsroom-and-speeches/press/2006/press/stern-06.cfm>.

¹⁹ For example, a study of UK population projections cites a census from 1891 that projected the combined population stock of Australia and New Zealand in 1981 to be 94 million, five times greater than the actual outcome. See *Accuracy and uncertainty of the national population projections for the United Kingdom*, Chris Shaw, *Population Trends* No.77, 1994, page 24. The study was revealed in a letter to *Royal Statistical Society News*, February 1994.

²⁰ *Fiscal Implications of Demographic Uncertainty for the United Kingdom*, James Sefton and Martin Weale, National Institute of Economic and Social Research, 2005.

²¹ Stochastic population projections have also been generated for other countries. A recent study projects an 80 per cent probability that the total combined population of a group of European countries (the EU15 plus Norway, Iceland and Switzerland) will be between 381 million and 474 million by 2050. See *New Forecast: Population decline postponed in Europe*, Juha Alho et al. *Statistical Journal of the United Nations ECE* 23, 2006. Similarly, stochastic projections suggest that there is a two-thirds probability that the population of Australia will be between 24.4 million and 31.8 million by 2051. See *Australia's uncertain demographic future*, Tom Wilson and Martin Bell, *Demographic Research* Vol. 11, 2004.

Scenarios 2.21 Another way to shed light on how future trends might evolve is to construct scenarios. These scenarios could be based on pre-determined (and therefore reasonably predictable) trends and uncertain developments, which are possible (but not necessarily likely) and could have a major impact on future developments. Scenario planning is a well-established discipline and is conducted by governments and businesses alike. By their nature, scenarios are not limited to linear extrapolations of past trends but can also take account of abrupt (assumed) changes.

2.22 For example, in the UK the Government is sponsoring the Foresight project, which has looked at different issues that affect society and how these might evolve over the next 20 years. Recent studies have covered issues as diverse as brain science, and the future of drug use and infrastructure systems. One of its current projects considers how levels of obesity may evolve in the future, and aims to “produce a long term vision of how we can deliver a sustainable response to obesity in the UK over the next 40 years”.

²⁰ Other projects include an analysis of sustainable energy management, as well as a study into mental capital and wellbeing.

INTRODUCTION

3.1 This chapter sets out the different methodologies that can be used to assess the long-term sustainability of the public finances. The chapter provides a summary of three complementary approaches to assessing sustainability: the national accounts measure of debt, GAAP-based¹ balance sheets and indicators based on comprehensive projections.

ASSESSING LONG-TERM FISCAL SUSTAINABILITY

Defining long-term fiscal sustainability

3.2 Any assessment of long-term fiscal sustainability will have to be made against a benchmark. There are many possible definitions of sustainability. One definition is that a government should be able to meet its obligations if and when they arise in the future. Sustainability will therefore also depend on a government's future revenue (with which it might be able to meet its obligations) and the timing of the future obligations. The ability to meet obligations when they arise implies that a government should consider debt financing only as long as the debt burden remains at a prudent level. The definition is therefore in the spirit of the Government's sustainable investment rule.

3.3 In this chapter three different approaches that could be used to assess long-term sustainability are discussed.² These approaches are:

- the national accounts measure of public sector (net) debt;
- GAAP-based balance sheets, which will be prepared as part of Whole of Government Accounts (WGA); and
- fiscal indicators based on comprehensive projections of future spending and revenue.

National accounts measure of net debt

3.4 These different approaches have their respective advantages and disadvantages. Measures of public debt have often been the prime focus when analysing the sustainability of the public finances. Debt (less liquid financial assets) is the cumulative effect of past borrowing, and as such provides a measure of obligations created in the past that have been accumulated to date. One particular advantage is that the national accounts approach, which underpins measures of debt, is based on internationally agreed rules, allowing the public finances in one country to be compared with those in other countries. Furthermore, debt can easily be understood and interpreted as a concept, helping to improve transparency. Obviously, debt is a backward-looking indicator and cannot answer the question of whether a government will be able to meet its obligations if and when they arise in the future.

GAAP-based balance sheets

3.5 GAAP-based accounts look at past transactions and the extent to which these have already committed future funding flows; they therefore provide a fuller picture of an entity's position than a simple cash statement by including all of that entity's assets and liabilities. One of the balance sheet's advantages is that it will show a wider range of assets and liabilities than net debt, including financial and non-financial assets and liabilities as well as provisions for future cash transfers arising from past events. However, as with debt, GAAP-based balance sheets are mainly backward-looking. For example, they do not include future spending and revenue that will occur as a result of future events, which limits the balance sheet's use in assessing long-term fiscal sustainability.

¹ Generally Accepted Accounting Practice.

² For more details of these approaches, see previous Long-term public finance reports, Chapters 3 and 4. A more technical discussion of the fiscal indicators can be found in the 2002 *Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, November 2002.

Indicators based on comprehensive projections 3.6 Indicators based on comprehensive projections will generally take account of existing liabilities (for example debt) but also include information about future spending and revenue streams. As such they can provide an answer to the question whether government will be able to meet its obligations if and when they arise in the future. The main limitation is that projecting into the future is inevitably subject to a high degree of uncertainty, making sensitivity analysis and careful interpretation of the results important. Box 3.1 provides more information on these indicators.

Box 3.1: Indicators based on comprehensive projections**Top-down approach**

The *Code for Fiscal Stability*^a requires that illustrative long-term projections of the outlook for the key fiscal aggregates are presented for a period of no less than ten years into the future, based on a range of plausible assumptions. These projections, which are presented in Annex A of the Economic and Fiscal Strategy Report, are derived using a top-down approach. This approach starts with a set of constraints on fiscal aggregates, for example the debt to GDP ratio, and then determines what spending or revenue path would be required to meet these constraints, given likely demographic and economic developments. One of the main strengths of this approach is that it can be based on the assumption that the Government's fiscal rules are met. As such, the top-down approach answers the question what resources are available for future spending, assuming that the fiscal rules are met.

Bottom-up approach

The bottom-up approach projects the path of individual spending and revenue items, either in absolute terms or as a share of GDP, into the future, without any constraints on the fiscal aggregates. Bottom-up projections can take into account a wide range of factors including demographic developments, cost and demand drivers, and investment requirements. An advantage of bottom-up projections is that they allow the individual drivers of each spending and revenue item to be examined in more detail. However, by looking at taxation and spending items in isolation from the rest of a government's fiscal policy decisions, the results can paint an unrealistic picture of the future path of aggregate spending and revenue.

A comprehensive set of bottom-up spending and revenue projections can also be used to derive future primary balances. A number of fiscal sustainability indicators are based on the relationship of projected primary balances in the long term and the initial debt stock. These indicators form an integral part of the assessment of long-term fiscal sustainability presented in this Report.^b

Arguably the two most popular indicators in the economics literature are the so-called intertemporal budget constraint (IBC) and the fiscal gap. These are also the main indicators used in this Report. The intertemporal budget constraint states that the present discounted value (PDV) of all future primary balances must equal the current level of debt. If the PDV of future primary balances is not sufficient to cover the current debt burden, then the fiscal stance needs to be tightened. The intertemporal budget gap, which measures the extent of the imbalance, can be used to calculate the immediate and permanent change in the fiscal stance to meet the IBC.

By contrast, the fiscal gap indicator calculates the immediate and permanent change in the primary balance needed to achieve a certain, pre-determined debt target in the future. The required change in the primary balance to GDP ratio depends on the initial and desired target ratios, the time horizon and the projected primary balance.

^a *Code for Fiscal Stability*, HM Treasury, March 1998.

^b See 2005 *Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, December 2005, Chapter 3 for a more detailed discussion, while the 2002 *Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, November 2002, provides technical derivations of the indicators.

4

ASSUMPTIONS

DEMOGRAPHY

4.1 The population projections used in this Report are the latest projections available, in other words the Government Actuary's Department (GAD) 2004-based principal population projections. These were published in October 2005 and were also used for the projections in the 2005 *Long-term public finance report*. Chapter 2 provides more information on these population projections.

LABOUR MARKET

4.2 The Report requires assumptions on labour market participation rates and the unemployment rate. These are needed for a number of reasons, including:

- transfers such as Jobseeker's Allowance depend on unemployment rates;
- future state pension expenditure depends on entitlements. For example, the gradual rise in the female participation rate will, everything else equal, lead to greater pension spending in the future as these women build up higher pension entitlements; and
- projections of the working-age population, and assumptions on rates of participation in the labour market and unemployment (and hence the employment rate) are needed to derive employment levels. These in turn are necessary, alongside productivity assumptions, to derive economic growth rates and hence future GDP levels.

4.3 This year's Report uses the so-called 'cohort' method to project employment levels.¹ Studies by the Organisation for Economic Co-operation and Development (OECD)² and analysis of the long-term sustainability of the public finances in EU Member States conducted by the European Union's Economic Policy Committee (EPC) also utilise this approach.³

Projecting employment levels

4.4 The cohort method of projecting employment trends captures the negative impact of an ageing workforce on overall participation (due to older workers generally having lower participation rates than younger workers) and the effect of current young cohorts gradually replacing current older cohorts. This is important, as given generations or cohorts have their own specific level of participation that is usually different from the corresponding level of participation of preceding generations. Annex B of the 2005 *Long-term public finance report* provides a more detailed discussion of the underlying methodology.

¹ This method was also adopted for the 2005 *Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, December 2006.

² *Coping with Ageing: A Dynamic Approach to Quantify the Impact of Alternative Policy Options on Future Labour Supply in OECD Countries*, OECD, June 2004.

³ *The 2005 projections of age-related expenditure (2004-2050) for the EU-25 Member States: underlying assumptions and projection methodologies*, Economic Policy Committee and European Commission, November 2005.

Employment and the State Pension age

4.5 A major difference between this year's and last year's employment projections is that the former explicitly take into account the proposed changes to the State Pension age as announced in the Government's White Paper *Security in retirement: towards a new pensions system*,⁴ and set out in the Pensions Bill currently before Parliament.⁵ The White Paper proposes a gradual increase of the State Pension age in line with gains in average life expectancy. This will begin with a rise from 65 to 66 years over a two-year period from 2024, then again by one year over a two-year period from 2034 and from 2044.

4.6 It is reasonable to assume that the proposed increases in the State Pension age as outlined in the White Paper will have a positive effect on future participation levels. Historical evidence suggests that the State Pension age has a significant impact on labour supply decisions. Indeed, evidence from other countries suggests that the pension age is a major determinant of labour market participation rates at certain ages.⁶

4.7 However, it is difficult to predict with complete accuracy the impact of the proposed increase in the State Pension age on labour markets, not least because the role of the State Pension age in the decision to participate may be very different in the future. To capture this uncertainty in the employment projections, three variants have been developed, in collaboration with the Department for Work and Pensions (DWP): 'lower', 'middle' and 'upper'.⁷ Each of these variants represents a different estimate of the possible effect of the increase in the State Pension age on future labour market participation. For the purposes of the projections used in this Report, the 'middle' variant has been used to capture the likely labour market impact of the proposed increase in the State Pension age. Box 4.1 provides more details of the approach used to construct each of these variants.

⁴ *Security in retirement: towards a new pensions system*, Department for Work and Pensions, May 2006. Box 4.2 provides details of the assumptions used to account for the pensions reforms in projections of State Pension expenditure.

⁵ The approach used to model the impact of the proposed increase in the State Pension age upon employment is consistent with the methodology adopted in *Pensions Bill: Regulatory Impact Assessment*, Department for Work and Pensions, November 2006.

⁶ A cross-country analysis of 22 OECD countries finds that the 'standard retirement age' has a significant and positive effect on the participation rate of the 60-64 and 65+ age groups. See *The retirement effects of old-age pension and early retirement schemes in OECD countries*, Romain Duval, OECD working paper no. 270, 2003. Similarly, New Zealand observed a substantial increase in participation rates of the 55-59 and 60-64 age groups following an increase in the pension age from 60 years to 65 years between 1992 and 2001. See 2005 *Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, December 2005, page 74, for more information on the New Zealand pensions reform and its impact on labour market activity.

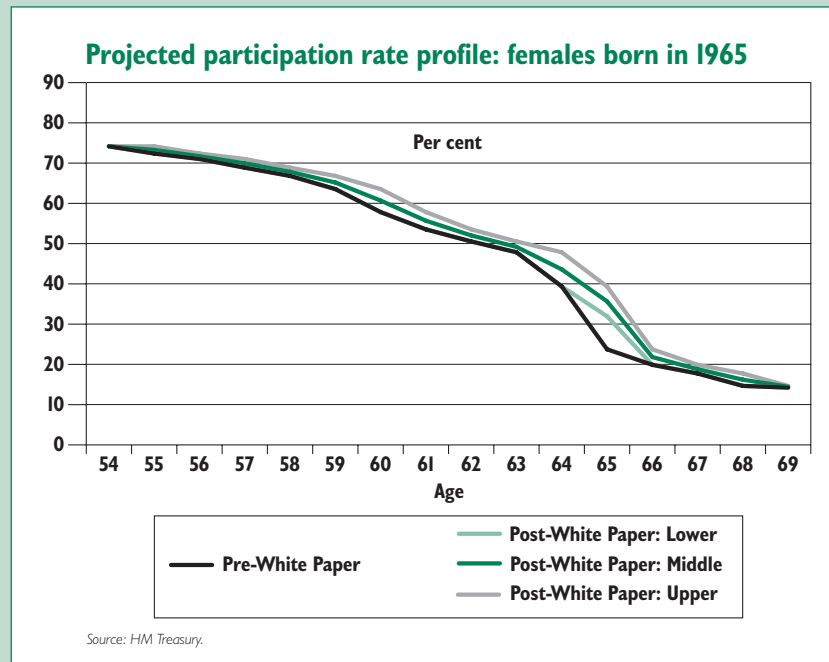
⁷ The increase in the female State Pension age from 60 years to 65 years over the period 2010 to 2020 is also taken into account in the employment projections, using a similar approach. For more details, see 2005 *Long-term public finance report: an analysis of sustainability*, HM Treasury, December 2005, page 73.

Box 4.1: Adjusting for the proposed increase in the State Pension age

To capture the possible labour market effects of the proposed increase in the State Pension age, two behavioural effects were considered. A ‘lower’ estimate is to assume that those cohorts affected by the reform only increase their labour supply at the age(s) for which they are no longer eligible for a state pension. In other words, for the increase in the State Pension age from 65 to 66 years between 2024 and 2026 it is assumed that the cohorts affected by this change (such as females born in 1965) only adjust their labour market behaviour at the age of 65. This is the minimum behavioural response that can reasonably be expected. As can be seen from the chart below, this adjustment is made by extrapolating the participation rate profile so that the slope of the profile is constant from 63 years to 65 years. A similar assumption is used to adjust the participation rates of 65 and 66 year olds following the increase in the State Pension age to 67 (between 2034 and 2036) and the participation rates of 65, 66 and 67 year olds following the increase in the State Pension age to 68 (between 2044-46).

By contrast, the ‘upper’ estimate assumes that those cohorts affected by the increase in the State Pension age begin to increase their labour supply earlier in their lifetimes, from the age of 55 onwards.^a Specifically, for the increase in the State Pension age to 66 years it is assumed that the participation rate profiles of these cohorts are ‘shifted’ to the right by one year. As can be seen from the chart, this adjustment increases the participation rate at 65 years of females born in 1965 by around 15 percentage points (a similar approach is used for males). For the subsequent increases in the State Pension age to 67 and 68 years, the participation rate profiles of cohorts affected by these changes are shifted to the right from the age of 55 years by two and three years respectively.

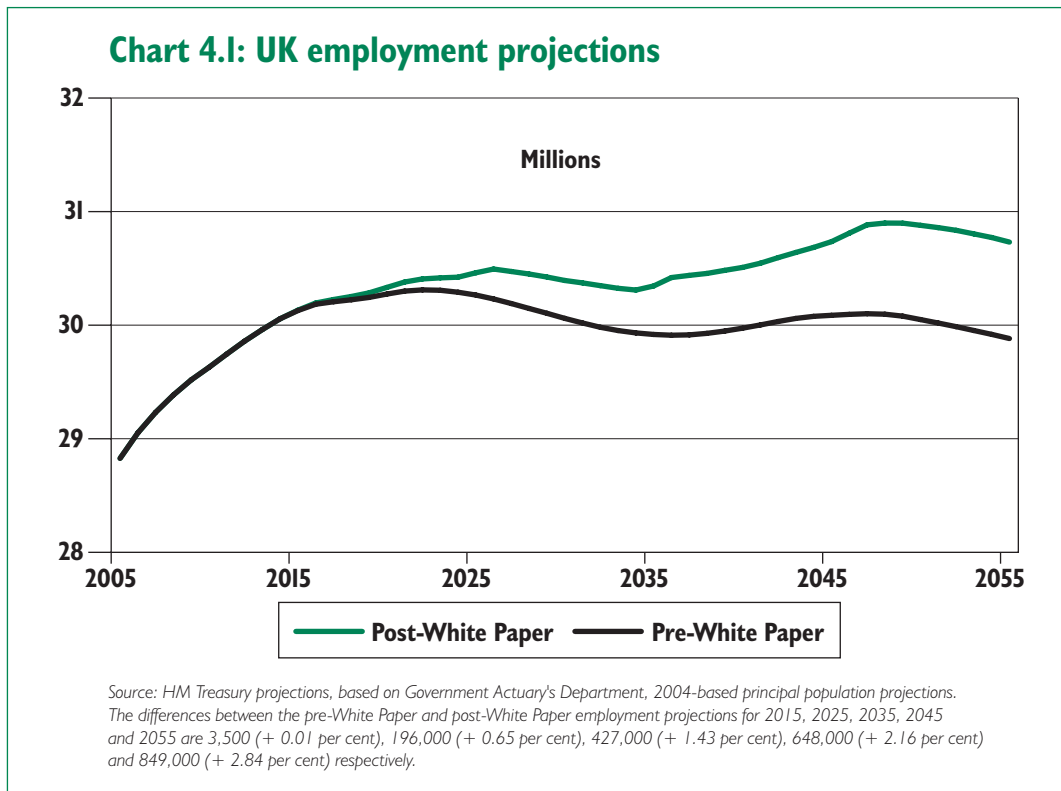
The ‘middle’ variant represents an average of these two behavioural extremes, and therefore provides a reasonable estimate of the likely labour market effect of the proposed increase in the State Pension age.^b Box 4.2 provides details of the assumptions used to account for the pensions reforms in projections of state pension expenditure.



^a Historical data indicate that participation rates typically begin to fall significantly from the age of 55 onwards. It is therefore reasonable to assume that this is the earliest age at which the State Pension age begins to affect behaviour.

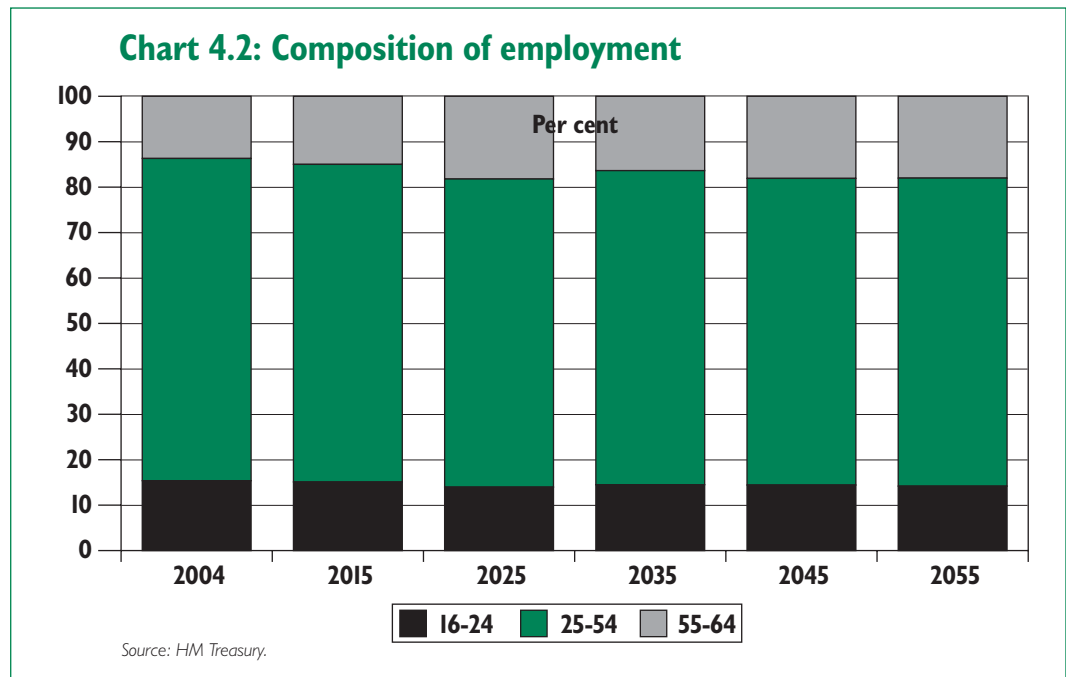
^b The effect of the State Pension age on labour market participation using the ‘middle variant’ is broadly in line with estimates of the labour market effect of the State Pension age produced in a recent study by the Office for National Statistics. See *Labour Force Projections 2006-2020*, Office for National Statistics, January 2006.

4.8 Chart 4.1 shows projections of employment for the UK over the next 50 years, where ‘employment’ is defined across the age group 16 years to 69 years.⁸ Using the ‘middle’ variant adjustment for the proposed increase in the State Pension age (see Box 2.1), the new projection indicates that employment will continue to rise until the mid 2020s before more or less stabilising at 30½ million, just under 2 million higher than now. From 2035, employment is projected to observe a further increase, to around 31 million by 2050. The chart shows that the proposed increase in the State Pension age is projected to increase the aggregate employment level by nearly 1 million persons by 2050.



4.9 In addition to future trends in the aggregate employment level, it is useful to consider projected changes in the age composition of employment over time. Box 2.1 in Chapter 2 shows that the age structure of the entire working-age population is projected to remain relatively stable over the next 50 years, with only a small increase in the proportion of those aged between 55 and 64 years. Chart 4.2 suggests that the projected shift in the age structure of employment is likely to be more marked, with the share of the 55-64 year old age group in employment projected to increase by over 4 percentage points between 2004 and 2055. This reflects a large projected increase in the employment rate of this age group, as the proposed increase in the State Pension age is assumed to have a positive effect on the labour market participation of those nearing retirement.

⁸ The baseline projection of employment therefore includes individuals who are above the State Pension age. This is done because a substantial number of people above that age are projected to be in employment and will therefore contribute to projected GDP growth.



PRODUCTIVITY AND GROSS DOMESTIC PRODUCT (GDP)

Productivity growth 4.10 The productivity growth assumption (output per person) used in the baseline projections is 2 per cent per year as in previous reports. This is the average long-term productivity growth rate for the UK since the mid 1950s.

4.11 In addition to the baseline assumption, lower and higher productivity growth assumptions of $1\frac{3}{4}$ per cent and $2\frac{1}{4}$ per cent per year are also used to provide some sensitivity analysis. Annex A of the Economic and Fiscal Strategy Report (EFSR) stresses that the lower productivity growth assumption is cautious.⁹

GDP growth 4.12 Given assumptions regarding productivity and projections of employment growth, it is possible to derive projected GDP growth beyond the end of the medium-term forecast period. Table 4.1 shows the average real GDP growth rates in the coming decades for the baseline projections, using the latest projection of employment growth. It is worth noting that this growth rate is substantially lower than what has been recorded on average over the last ten years. Indeed, it is lower than the cautious assumption of trend growth of $2\frac{1}{2}$ per cent over the medium term used for the medium-term public finance projections.¹⁰

⁹ Economic and Fiscal Strategy Report in Budget 2006: *A strong and strengthening economy: Investing in Britain's future*, HM Treasury, March 2006.

¹⁰ The employment projections used for the purposes of this Report are defined across the age group 16 years to 69 years. If employment levels were defined according to the State Pension age (as is used for the assumption of trend growth of $2\frac{1}{2}$ per cent over the medium term) then a larger increase in employment would be observed as a result of the increase in the female State Pension age from 60 years to 65 years between 2010 and 2020.

Table 4.1: Real GDP growth and its components in the baseline scenario (per cent)¹

Year	2015-16 to 2024-25	2025-26 to 2034-35	2035-36 to 2044-45	2045-46 to 2054-55
Productivity	2	2	2	2
Employment	0	0	0	0
Real GDP	2	2	2	2

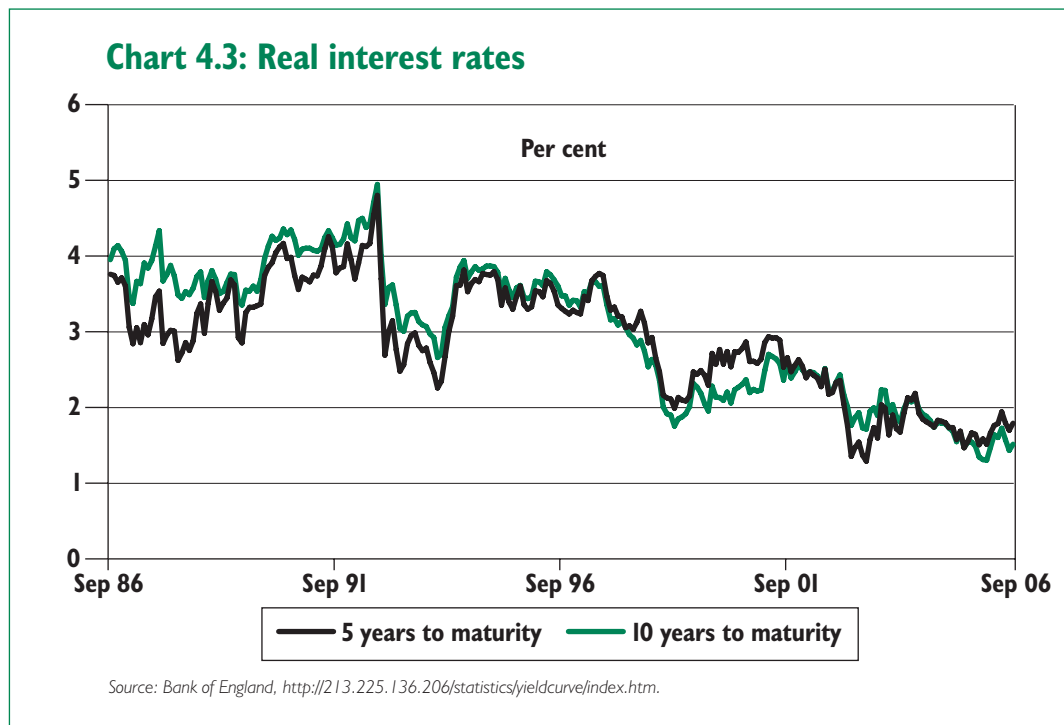
¹ Productivity growth is 1¾ per cent and 2¼ per cent in the low and high productivity scenarios respectively.

Source: HM Treasury.

DISCOUNT/DEBT INTEREST RATE

4.13 The forward-looking approaches to long-term fiscal sustainability (see Chapter 3) require a discount/debt interest rate assumption. This is necessary either to calculate the present discounted value of future spending and revenue flows or to project debt into the future.

4.14 A discount rate can be derived from data on long-term real interest rates based on index-linked gilts. As Chart 4.3 shows, real interest rates have varied between 1 per cent and 5 per cent since 1986, and have remained between 1 per cent and 4 per cent since 1998, averaging less than 2½ per cent since 2000. To provide some sensitivity analysis, the Report presents results based on discount rate assumptions of 2½ per cent, 3 per cent and 3½ per cent.



4.15 The discount/debt interest rate assumptions are higher than the real interest rates for UK government bonds with five- and ten-year maturities have been since the end of the 1990s.¹¹ However, they are in line with the recommendations of the 2003 Green Book.¹² The Green Book is a best practice guide for all central Government departments and executive agencies on the process of project appraisal and evaluation. The 2003 Green Book recommends a discount rate of 3½ per cent but also states that there are a number of circumstances (for example when the impacts occur over the long term as in these calculations of long-term fiscal sustainability), in which a lower discount rate may be appropriate.¹³

SPENDING AND REVENUE

Current policies are assumed

4.16 The long-term projections are based on the assumption of current policy, in other words it is assumed that the Government will leave current policy unchanged in the future. This should not be interpreted as meaning that policy will not change over time but it is used so that the long-term projections do not prejudge future Government policy. The assumption of current policy is frequently used in long-term projections, for example in the illustrative long-term fiscal projections in Annex A of the EFSR and by the EPC.¹⁴

4.17 Current policy has been interpreted as all policy already in place or announced in this year's Pre-Budget Report. Current policy refers to the level of per capita spending and revenue in 2011-12, in other words what is used for the projections is the level of spending and revenue per head at the end of the medium term, and not the growth rate of spending and revenue in that particular year. Box 4.2 provides more information on the assumptions used in this Report relating to the Pensions White Paper.

¹¹ See 2005 *Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, December 2005, page 35 for a discussion of ultra-long gilt issuance by the UK Debt Management Office in 2005.

¹² *The Green Book: appraisal and evaluation in central government*, HM Treasury, 2003.

¹³ The EU's Economic Policy Committee also assumes a real interest rate of 3 per cent for the purposes of their age-related spending projections. See *The impact of ageing on public expenditure: projections for the EU25 Member States on pensions, health care, long-term care, education and unemployment transfers*, Economic Policy Committee and European Commission, February 2006.

¹⁴ *Ibid.*

Box 4.2: Projecting state pension spending

The Pensions White Paper^a published in May 2006 announced a set of reforms to state pensions. Included in these reforms was the commitment to re-link the basic State Pension to increases in average earnings. The White Paper stated that: “During the next Parliament, we will re-link the uprating of the basic State Pension to average earnings. Our objective, subject to affordability and the fiscal position, is to do this in 2012, but in any event by the end of the next Parliament at the latest. We will make a statement at the beginning of the next Parliament.”^b

The *Long-term public finance report* provides a comprehensive analysis of long-term socio-economic and demographic developments, and their likely impact on the public finances. It does not provide a framework for making decisions around shorter-term spending commitments and as such does not provide an assessment of the affordability of state pension reforms in the short to medium term.

For the modelling of White Paper reforms it is assumed that the reforms to state pensions and Pension Credit announced in the White Paper, and now set out in the Pensions Bill Regulatory Impact Assessment, are implemented. Consistent with the White Paper statement above, and the figures presented in the White Paper, it is assumed that the basic State Pension is linked to increases in average earnings from 2012 onwards. This is a prudent and cautious assumption and leads to an upper estimate of the cost of the basic State Pension uprating. The decision on when to re-link the basic State Pension to earnings will be subject to affordability and the fiscal position.

In addition it is assumed that, as set out in the White Paper:

- the State Second Pension is reformed so that it becomes a simple flat-rate weekly top-up to the basic State Pension. Accruals will start to become flat rate at the same time as the basic State Pension is linked to earnings. It is estimated that the State Second Pension will become completely flat rate around 2030 or shortly afterwards;
- before implementing the earnings link of the basic State pension, means-tested provision continues to be focused on those with small savings, by taking steps from 2008 to target the Pension Credit on this group; and
- from 2010 the contributory principle is radically reformed by recognising contributions to society while retaining the link between rights and responsibilities.

To simplify decision-making, members of defined contribution pension schemes will no longer be able to contract out of the State Second Pension. It is expected that this measure will commence at the same time as the basic State Pension is linked to earnings.

These assumptions have been incorporated in the baseline projections for ‘state pensions’ expenditure, along with the assumption that the State Pension age will be raised gradually in line with expected gains in average life expectancy, beginning with a rise from 65 years to 66 years over a two-year period from 2024, then again by one year over a two-year period from 2034 and from 2044. Box 4.1 provides details of the assumptions used to capture the potential labour market effects of the proposed increase in the State Pension age.

^a *Security in retirement: towards a new pensions system*, Department for Work and Pensions, May 2006.

^b *Ibid*, page 17.

^c *Pensions Bill: Regulatory Impact Assessment*, Department for Work and Pensions, November 2006.

**Updated
spending and
revenue profiles**

4.18 This year's Report is based on updated age profiles for males and females for all major spending and revenue categories.¹⁵ Previous reports were based on profiles, which had mainly been calculated by the National Institute of Economic and Social Research (NIESR), and used before in the context of generational accounts for the UK.¹⁶ As in previous years, the profiles have been derived from household or individual micro-data. Where necessary, other Government departments also provided data. The profiles present the latest data available.

4.19 The profiles capture the age distribution of spending and revenue over a representative individual's lifetime. The intuition behind the age profiles can be best described with a simple example. Assume that a person lives only two ages, 'young' and 'old'. When 'young' the person consumes £10 of a particular government service, when 'old' £20. Lifetime consumption is therefore £30. The age profile would therefore be a third for 'young' and two-thirds for 'old'. Note that this age profile does not say anything about the absolute amount of consumption. The same profile would apply if the person consumed £1000 when 'young' and £2000 when 'old'. This approach can be extended to cover all possible ages (in this exercise the age limit is set to 101 years).

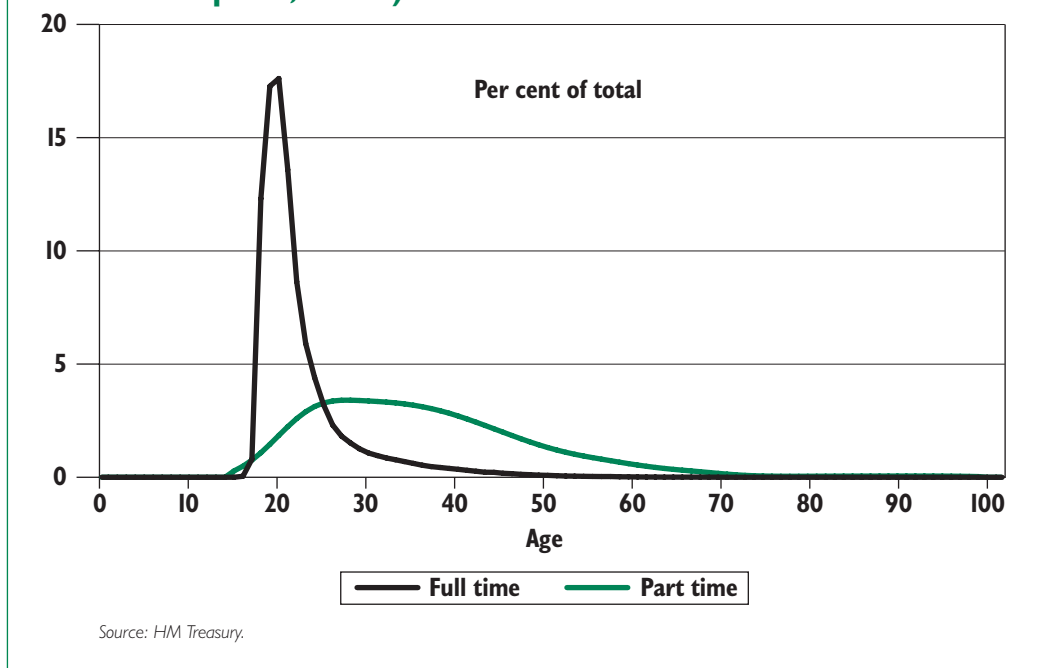
4.20 Chart 4.4 provides the age profiles for full-time and part-time higher education for a representative male as examples.¹⁷ Assuming that the representative male will live to 101 years, the profile shows the percentage consumed of total lifetime spending on full-time (part-time) education at any specific age. Over the entire life, the representative male will consume all of the full-time (part-time) spending on higher education and hence the area below the profile will add up to 100 per cent. The chart shows that the representative male consumes around 17½ per cent of total lifetime spending on full-time higher education in every year between the ages of 20 and 22, in other words around half of lifetime spending will be consumed aged 20 to 22 years. After the age of 22, the profile shows a rapid decline, converging towards 0 by age 50. This reflects the fact that the number of students enrolled in full-time higher education drops rapidly with increases in age.

¹⁵ The breakdown of spending and revenue follows the classification of function of government (COFOG).

¹⁶ For more details how the specific profiles were derived see *Generational accounting in the UK*, Roberto Cardarelli, James Sefton, and Laurence J. Kotlikoff, *Economic Journal*, 2000.

¹⁷ More examples can be found in previous reports.

Chart 4.4: Profiles of higher education (total final consumption, males)



4.21 The picture is very different for part-time higher education. Generally more mature people, often with previous work experience, enrol in part-time higher education courses. In addition, the age band is much wider, with males in their 50s and 60s enrolling too. This is reflected in the shape of the profile.

Per capita allocations and contributions

4.22 With these profiles, information on the number of males and females at each age, and the total money amount for the spending and revenue items, it is possible to derive the per capita allocation or contribution as a share of total spending or total revenue on the different spending and revenue items.

4.23 The projection model calculates per capita allocations and contributions for all the spending and revenue items, using the spending and revenue profiles and information on total spending and revenue from HM Treasury’s latest medium-term public finance projections. The projection model raises the per capita allocations and contributions in line with productivity gains over the projection horizon, except in the few cases where current policy is to uprate spending in line with prices. These per capita terms are then combined with the population projections to generate spending and revenue projections. The projections can then be used to calculate the indicators discussed in Chapter 3.

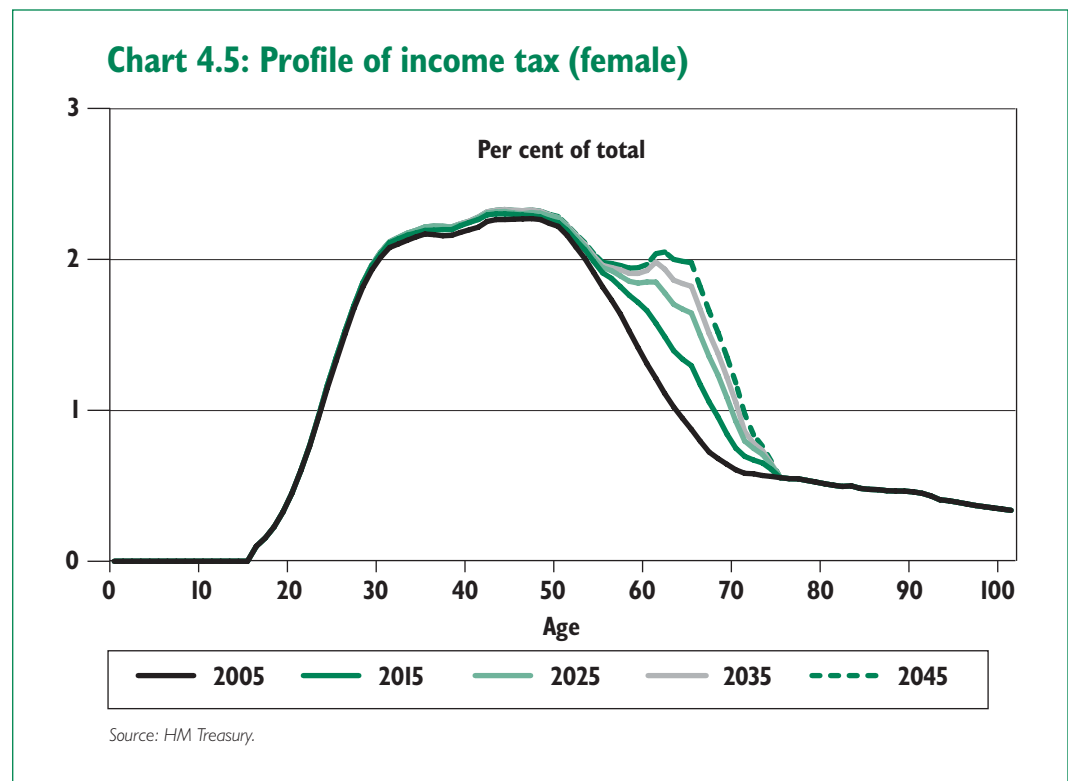
Exceptions

4.24 As in previous years, there are a number of spending and revenue items that are not projected using the methodology described above. The exceptions can be split into two broad groups:

- first, based on the macroeconomic assumptions described above, a number of spending and revenue items are projected outside the Treasury’s long-term projection model. This is to take advantage of specific long-term projection models available in other Government departments; and
- second, a number of spending and revenue items are projected using a shifting profile. Shifting profiles could capture expected changes in the contribution to revenue for specific age groups and changes in the demand for public spending from specific age groups.

4.25 The social security and public service pension projections fall into the first group. The Department for Work and Pensions projects social security spending, using models which capture the complexities of the individual benefit item. The GAD projects unfunded public service pensions, again using models specifically designed for this purpose.¹⁸ As a result, the GAD projections pick up scheme-specific characteristics such as maturity and the age structure of the workforce as well as scheme-specific policies, which would not be captured by the Treasury’s long-term projection model.

4.26 The second group comprises the income tax and national insurance contributions (NICs) projections. The profiles for these items have been shifted so as to maintain consistency with the employment projections. As discussed above, the employment rate of, in particular, older females, is projected to increase over the coming decades. Everything else equal, higher employment rates should lead to higher income tax and NICs. A fixed profile would fail to pick up this expected increase. Chart 4.5 shows the shift in the income tax profile for females over time.



Refined modelling of health care trends

4.27 The 2004 and 2005 Long-term public finance reports assumed that healthy life expectancy increases in line with rises in overall life expectancy.¹⁹ To capture this assumption, the health and long-term care profiles were shifted to the right. Unlike in the 2004 and 2005 reports, the health and long-term care profiles used in this year’s Report have not been shifted. Recent evidence published by the King’s Fund suggests that improvements in healthy life expectancy in the UK might have not been as marked over previous decades as previously

¹⁸ The Government Actuary’s Department intends to publish by the end of 2006 information on the methodology and assumptions adopted for their projections of cash flows in respect of unfunded public service pension schemes. See <http://www.gad.gov.uk>.

¹⁹ See 2004 *Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, December 2004, pages 18 to 19 for a discussion of trends in healthy life expectancy.

thought.²⁰ Rather than growing in line with overall life expectancy, healthy life expectancy appears to have increased less rapidly.²¹ The baseline health and long-term care projections presented in Chapter 5 are therefore based on unchanged profiles. This is in line with a cautious approach to assessing the long-term sustainability of the public finances. However, global evidence is mixed. For example, studies in the United States found that healthy life expectancy has risen significantly over the last few decades.²² To illustrate the sensitivity of the health projections to changes in the underlying assumptions, Chapter 5 provides a variant projection based on shifting profiles.

4.28 In addition, separate profiles of per capita expenditure by age band were developed for survivors and decedents, for the Hospital and Community Health Services (HCHS). This follows the approach used in the Wanless review²³ and constitutes a significant improvement on the methodology used in previous years. The basis for the approach is the finding that a high proportion of lifetime utilisation of health care costs is concentrated in the final year of life. As the Wanless review argued: "...there is a considerable body of evidence from the UK and other countries that demonstrates that acute health care costs are strongly associated with proximity to death".²⁴ If this finding is ignored and a single profile is used for survivors and decedents, the impact of demographic pressures is over-estimated.

4.29 Estimates of total HCHS expenditure by age band are available from the Department of Health programme budget 2003-04. Estimates of the ratio of per capita expenditure by age on survivors and decedents are available from an analysis of Scottish data conducted for the Wanless review. The programme budget estimates were split between survivors and decedents, by age band, on the basis of the Scottish findings.²⁵

²⁰ *Securing Good Care for Older People: Taking a long-term view*, Derek Wanless, 2006.

²¹ Recent estimates (for Great Britain) produced by the Office for National Statistics indicate that healthy life expectancy, as a share of total life expectancy fell from 91 per cent in 1981 to 88½ per cent in 2001 for males, and from 87 per cent in 1981 to 85½ per cent in 2001 for females. See <http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=12964&Pos=3&ColRank=2&Rank=272>.

²² Estimates presented in *Long-Term Trends in Life Expectancy and Active Life Expectancy in the United States*, Kenneth G. Manton, XiLiang Gu and Vicky L. Lamb, *Population and Development Review*, 2006 suggest that 'active' life expectancy (one of a number of measures of 'healthy' life expectancy) at 65 years increased more rapidly than total life expectancy between 1982 and 1999.

²³ *Securing our Future Health: Taking a long-term view Interim Report*, Derek Wanless, 2001.

²⁴ *Ibid*, page 137.

²⁵ *Proximity to death and acute health care utilisation in Scotland*, Barbara Graham and Yvonne Goodall, Scottish Executive, 2002.

INTRODUCTION

5.1 This chapter presents the results of this year's Long-term public finance report. The results are presented in terms of indicators based on historical data and forward-looking indicators. The latter are presented on a range of discount rate and productivity growth rate assumptions, thereby illustrating some of the uncertainty regarding long-term projections.¹ The results are compared with those presented in previous reports and other international studies.

5.2 The analysis in this Report assumes, for modelling purposes, that spending and taxation policies at the end of the medium term, as presented in the 2006 Pre-Budget Report,² are continued into the future. The nature of these assumptions does not mean that the Government has made a commitment to continue current policy. Similarly, it does not mean that there will be no changes to spending and taxation in the future, the former, for example, will depend on the results of future Spending Reviews.

Long-term sustainability and the fiscal rules

5.3 As discussed in Chapter 3, there are a variety of indicators that can be used to assess long-term fiscal sustainability. What matters from the Government's perspective is keeping within the fiscal rules as discussed in Chapter 1. Importantly, the Government aims to meet the fiscal rules over the cycle. It does not make sense to try to set fiscal policy now to meet exactly the fiscal rules over, say, 20, 50 or 100 years – the uncertainties are simply too great. Moreover, at these horizons the range of policy instruments available is much greater than simply changing spending plans and tax rates. A wide range of structural reforms could also make a vital contribution.

INDICATORS BASED ON HISTORICAL DATA

Net debt, net worth and indicative net liabilities

5.4 A common starting point for thinking about long-term fiscal sustainability is to consider a sustainable debt to GDP ratio. The Government's sustainable investment rule is based on this idea. The sustainable investment rule states that public sector net debt will be held at a stable and prudent level over the cycle, and that, other things equal, net debt will be maintained below 40 per cent of GDP over the economic cycle.

5.5 The national accounts measure of net debt is one of the key fiscal aggregates and is the basis for the Government's sustainable investment rule. The Government has reduced net debt, as a share of GDP, from more than 40 per cent in 1997-98 and Chart 5.1 shows that net debt has remained well below 40 per cent since then. Chapter 2 of the 2006 Pre-Budget Report provides updated projections of net debt as a share of GDP up to 2011-12.^{3,4} The chart also shows the public sector's net worth position, which is also taken from the national accounts. Net worth is a broader measure of sustainability than net debt as it includes non-financial, as

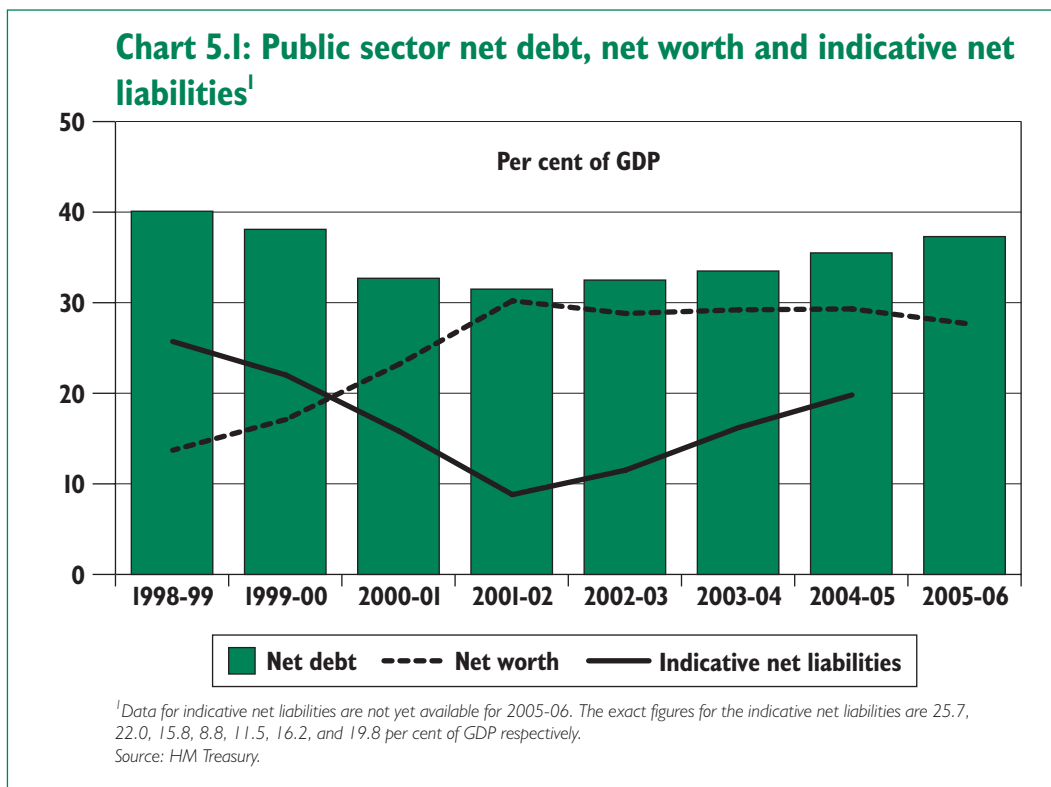
¹ The assumptions used in this Report are stated in Chapter 4.

² 2006 Pre-Budget Report, HM Treasury, December 2006.

³ *Ibid.*

⁴ In September 2006, the Office for National Statistics published estimates of Public Sector Net Debt including imputed finance lease liabilities. These liabilities arise mainly from Public Private Partnerships and Private Finance Initiatives projects. These data had not been included before due to data quality issues.

well as financial, assets. Between 1998-99 and 2001-02 net worth more than doubled as a share of GDP and has since then remained relatively stable. Unlike net debt, however, net worth is not at present used as a key indicator of the public finances because of difficulties involved in accurately measuring many government assets and liabilities.



5.6 Chart 5.1 also shows indicative numbers of net liabilities over the same period, derived from GAAP-based balance sheets for Government.⁵ Net liabilities are calculated as the difference between total assets and total liabilities. The former comprises the public sector capital stock and financial assets, while the latter includes government debt and provisions. The difference between net liabilities and net worth is that the former includes provisions (probable liabilities), as well as creditors (certain liabilities) which are included in net worth. Net liabilities, as a share of GDP, have been lower than net debt since 1997-98.⁶ This indicates that the value of the Government’s non-financial assets has exceeded that of its provisions, including those for public service pensions. The projections of future public spending, below, include the estimated cash flows associated with Government provisions and therefore take them into account in reaching the conclusions on long-term fiscal sustainability at the end of this chapter.⁷

ANALYSIS OF FUTURE SPENDING AND REVENUE

5.7 This section presents the results of the bottom-up spending and revenue projections on the baseline assumption of 2 per cent productivity growth per year, the Government Actuary’s Department (GAD) 2004-based principal population projections and the other modelling assumptions stated in Chapter 4.

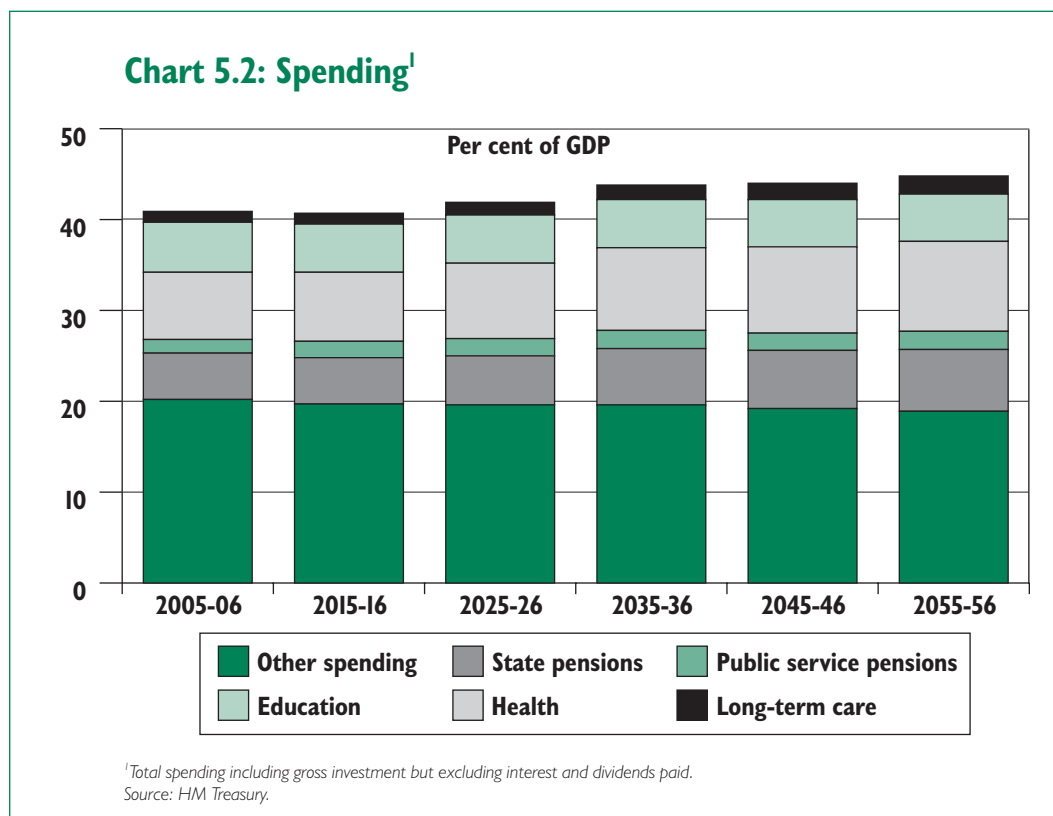
⁵ Generally Accepted Accounting Practice.

⁶ In 1997-98 net liabilities and net debt were 26.1 and 41.5 per cent of GDP respectively.

⁷ For a more detailed discussion of the relationships between net debt, net worth, net liabilities and the projections presented in this Report, see 2004 *Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, December 2004.

Spending projections

Projections, not forecasts **5.8** Caution must be exercised when interpreting the long-term spending projections because of the uncertainty surrounding the underlying assumptions. The results are based on projections (which depend on assumptions) and do not represent forecasts. Some trends are predictable, others are not. Chart 5.2 shows the evolution of total spending and some of the key spending items, as a share of GDP, over the next five decades.



Education 5.9 Education spending is projected to remain relatively stable over the coming decades, fluctuating between 5 and 5½ per cent of GDP. This reflects the fact that the number of people of education age (either in schools, higher education or further education) is projected to vary only slightly.

State pensions 5.10 State pension spending⁸ is projected to increase from just over 5 per cent of GDP in 2005-06 to around 6¾ per cent by the mid 2050s. As stated in Chapter 4, these projections are based on the policies set out in *Security in retirement: towards a new pensions system*⁹ and the *Pensions Bill Regulatory Impact Assessment*.¹⁰

⁸ State pension spending is defined as the sum of the basic State Pension, State Second Pension, Pension Credit, Winter Fuel Payments, Over 75 TV licenses, and Christmas Bonus.

⁹ *Security in retirement: towards a new pensions system*, Department for Work and Pensions, May 2006.

¹⁰ *Pensions bill: regulatory impact assessment*, Department for Work and Pensions, November 2006.

Health 5.11 Health spending is projected to increase from around 7½ per cent in 2005-06 to around 10 per cent of GDP by 2055-56 as the population ages. As in previous years, non-demographic factors that might affect health spending beyond the medium term are not modelled. The projected increase, as a share of GDP, is larger than that projected by the European Union's Economic Policy Committee (EPC).¹¹ In the EPC 'reference' projection, UK public health spending increases by 1.9 percentage points between 2004 and 2050. Alongside the reference projection, the EPC produced a number of variant health projections, which are discussed in more detail in Box 5.2. These variants and the differences between the baseline projections and the EPC 'reference' projections illustrate the uncertainty surrounding the health projections.

Long-term care 5.12 Long-term care spending is projected to increase from 1¼ per cent of GDP in 2005-06 to 1½ per cent by 2025-26 and then 2 per cent by 2055-56. The increase up to 2025-26 is similar to that derived in scenario 1 of the King's Fund study into long-term care in the UK.¹²

Public service pensions 5.13 Expenditure on public service pension benefits is projected to increase from 1½ per cent of GDP now to 2 per cent by 2055-56. This projected increase reflects recent changes in the size of the public service workforce, improved longevity and the fact that some schemes, and in particular the NHS scheme, are not yet mature. Box 5.1 analyses the projections further.

¹¹ *The impact of ageing on public expenditure: projections for the EU25 Member States on pensions, health care, long-term care, education and unemployment transfers (2004-2050)*, Economic Policy Committee and European Commission, February 2006, page 11.

¹² *Securing Good Care for Older People: Taking a long-term view*, Derek Wanless, March 2006.

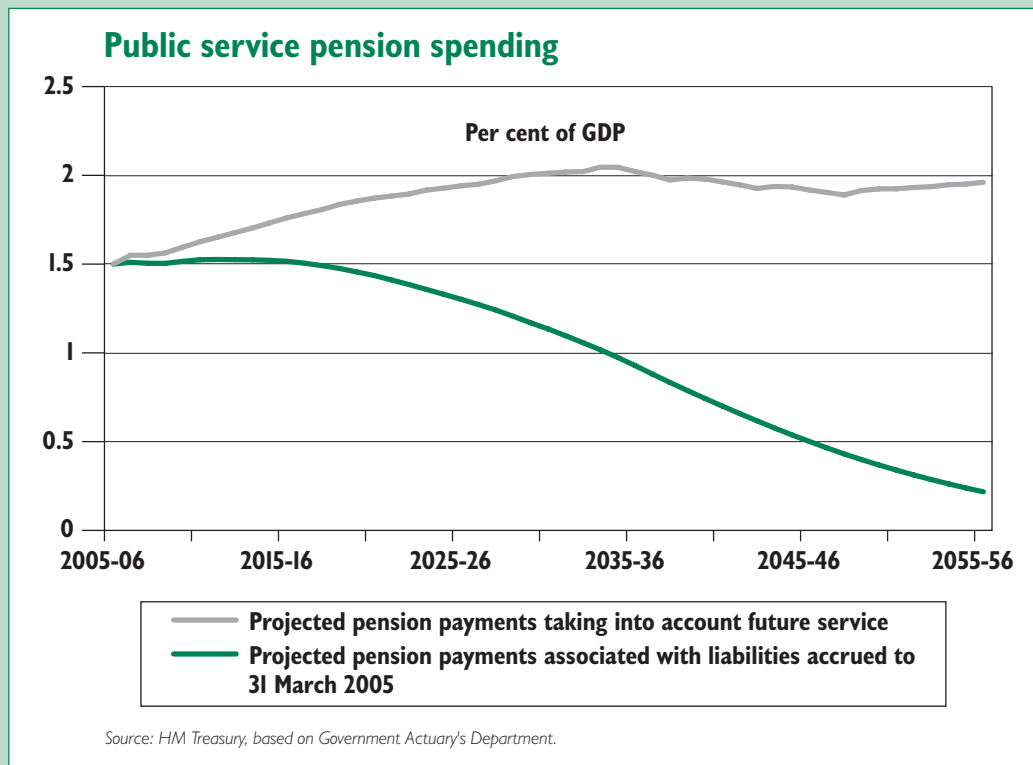
Box 5.1: Explaining the public service pension projections

The public service pension projections presented in this Report cover future spending as a result of entitlements accrued in the past and as a result of entitlements built up in the future. As such the projections are based on backward-looking and forward-looking information.

Public service pension spending today is entirely the result of entitlements built up in the past. The stock of these entitlements (the liability) will be unwound gradually over the coming decades.

Over the coming decades, scheme members will build up further entitlements to public service pensions. This group comprises current members until they will leave the public service (either due to retirement or leaving for other reasons) and future members. For this reason, assumptions regarding the turnover of public service employment, wage progression and overall public service employment, among others, are important.

The chart shows projected public service pension spending, as a share of GDP, and how much of this is due to entitlements already accrued. The chart shows that spending due to entitlements already accrued is projected to remain relatively stable, as a share of GDP, until around 2015 and then fall gradually towards zero. This means that public service pension spending in later decades will be increasingly the result of entitlements accrued in the future.



The long-term fiscal projections presented in this Report are therefore more comprehensive than backward-looking indicators such as GAAP-based net liabilities and present a more relevant picture of the long-term sustainability of the public finances than a backward-looking analysis could achieve.

Other spending 5.14 Spending on education, state pensions, public service pensions, and health and long-term care amounted to around half of total government spending in 2005-06. This share is projected to rise to around 57³/₄ per cent by 2055-56. In terms of GDP, the total of education, state pension, public service pensions, and health and long-term care spending is projected to be around 26 per cent by 2055-56. By contrast, other spending is projected to fall slightly, as a share of GDP, over the long term. This is because projected increases in ‘other’ consumption and capital spending (i.e. those unrelated to education, health and long-term care) are more than offset by projected relative falls in other spending items such as non-pension social transfers, which are, based on current policies, mainly increased in line with prices.¹³

Spending summary 5.15 The changing demographic structure of the UK’s population is projected to lead to an increase in public spending over the coming decades. Beyond the medium term, spending on education is projected to remain more or less stable as a share of GDP, while state pensions are projected to rise by just over 1½ percentage points. The increase in public service pensions reflects to a large degree the maturing of the existing schemes. Health and long-term care spending are projected to increase the most, rising from a combined 8.6 per cent of GDP in 2005-06 to nearly 12 per cent in 2055-56. Table 5.1 summarises the spending projections.

Table 5.1: Spending projections (per cent of GDP)

	2005-06	2015-16	2025-26	2035-36	2045-46	2055-56
Education	5.5	5.3	5.3	5.3	5.2	5.2
State pensions ¹	5.1	5.1	5.4	6.2	6.4	6.8
Health ²	7.4	7.6	8.3	9.1	9.5	9.9
Long-term care ³	1.2	1.2	1.4	1.6	1.8	2.0
Public-service pensions	1.5	1.8	1.9	2.0	1.9	2.0
Total age-related spending	20.8	21.0	22.3	24.3	24.8	25.8
Other spending	20.2	19.7	19.6	19.6	19.2	18.9
Total spending^{4,5}	40.9	40.7	41.9	43.8	43.9	44.7

¹ State pension spending is defined as the sum of the basic State Pension, State Second Pension, Pension Credit, Winter Fuel Payments, Over 75 TV licences, and Christmas Bonus.

² Gross NHS spending.

³ Excluding long-term care provided within the NHS which is accounted for under Health.

⁴ Total spending including gross investment but excluding interest and dividends payments.

⁵ Totals may not sum due to rounding.

Source: HM Treasury.

Projections and uncertainty 5.16 As noted, there is considerable uncertainty surrounding the assumptions underlying the long-term spending projections. One important assumption relates to the evolution of healthy life expectancy and future demand for health services as life expectancy (at birth but also at age 65 years) increases. Box 5.2 presents health projections based on a more optimistic assumption regarding the future evolution of healthy life in total life and discusses the potential role of non-demographic factors in driving future spending.

¹³ The projected increase in ‘other’ consumption and capital spending, as a share of GDP, reflects the substantial projected increase in the total UK population relative to the size of the workforce.

Box 5.2: Alternative health projections

As stated in Chapter 4, previous reports assumed that healthy life expectancy increases in line with rises in overall life expectancy. Previous reports captured this assumption by shifting the health profiles to the right.^a As Chapter 4 also states, the baseline projections in this Report no longer use this assumption, reflecting methodological changes to the projection model but also emerging evidence for the UK, which paints a slightly less positive picture of healthy life trends. Future health status will be an important determinant of demand for health care in the future and will ultimately be a major driver of health spending. Everything else equal, a more healthy population should require less health spending.

This box illustrates the impact of shifting the age-specific profiles for non-hospital health spending to the right on total health spending.^b As a large proportion of health spending is consumed by those aged 65 years and over, the shifts are based on projected changes of life expectancy at 65 years consistent with the GAD 2004-based population projections. Specifically, if life expectancy at age 65 years increased by one year between, say, 2010 and 2020, then the age profile would be shifted in such a way that a 66 year old in 2020 has the same demand for health services as a 65 year old in 2010.^c Using these assumptions, health care spending would be 8.0 per cent of GDP in 2025-26, 8.8 per cent in 2035-36, 9.1 per cent in 2045-46 and 9.4 per cent in 2055-56.

Future health status will not be the only determinant of future health spending. As the Wanless Review found, many other (non-demographic) factors, both on the supply side and on the demand side, will have an impact on future health spending.^d While it is impossible to say by how much future health spending will be affected by these factors, which include for example technological progress and changing preferences, some studies have used historical data on non-demographic cost drivers to project future health spending. For example, the New Zealand Treasury calculates a 'residual growth factor' using historical data, which captures relative price changes and technological progress.^e The New Zealand Treasury finds that health spending is projected to be higher in the long term with the residual factor included rather than excluded in the projection.

^a 2004 *Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, December 2004, pages 40 to 41.

^b As stated in Chapter 4, hospital care spending is projected using age-related and death-related cost profiles. As the split into age-related and death-related profiles is meant to capture some of the aspects of changes in healthy life expectancy, it would be inappropriate to shift the hospital care spending profiles.

^c The Personal Social Services Research Unit uses this approach (which they call the 'Brookings scenario') to illustrate different potential health trends. See *Thirty-Five Years On: Future Demand for Long-Term Care in England*, Personal Social Services Research Unit, *Research Summary 35*, March 2006.

^d *Securing our Future Health: Taking a Long-term View*, Derek Wanless, April 2002.

^e *New Zealand's Long-term fiscal position*, New Zealand Treasury, June 2006. Also see *Who is going broke? Comparing growth in healthcare costs in ten OECD countries*, Hagist and Kotlikoff, 2005.

Alternative pension projections 5.17 Box 5.3 discusses alternative projections for state pensions, based on the macroeconomic and demographic assumptions used by the European Union's Economic Policy Committee.

Box 5.3: Alternative state pension projections

In February 2006, the European Union's Economic Policy Committee (EPC) published a major study into the effects of demographic change on age-related spending in EU Member States over the coming decades.^a The pension projections (state pensions and public service pensions) published in the EPC study were provided by national authorities in the different Member States. The projections were generated using commonly-agreed demographic and macroeconomic assumptions but using national models so as to capture the complexities of the different pension systems. The projections were presented as a share of GDP, with the latter provided by the EPC.

The policy proposals made in the White Paper on pensions^b will also affect these projections. Modifying the baseline projections presented in this Report to take account of differences in the underlying demographic and macroeconomic assumptions, it is possible to express state pension spending as a share of GDP (as provided by the EPC). On this basis, state pension spending will be 5 per cent of GDP in 2010, 5.1 per cent in 2020, 5.9 per cent in 2030, 6.7 per cent in 2040 and 6.9 per cent in 2050.

These figures do not take into account the expected positive effect of the proposed pension reform on employment and hence GDP. The reform should lead to an increase in employment amounting to 0.2 per cent in 2020, 1.1 per cent in 2030, 1.8 per cent in 2040 and 2.8 per cent in 2050. Adjusting the EPC GDP projections by these amounts, then leads to state pension spending, as a share of GDP, of 5.9 per cent in 2030, 6.6 per cent in 2040 and 6.7 per cent in 2050.

^a *The impact of ageing on public expenditure: projections for the EU25 Member States on pensions, health care, long-term care, education and unemployment transfers (2004-2050)*, Economic Policy Committee and European Commission, February 2006.

^b *Security in retirement: towards a new pensions system*, Department for Work and Pensions, May 2006.

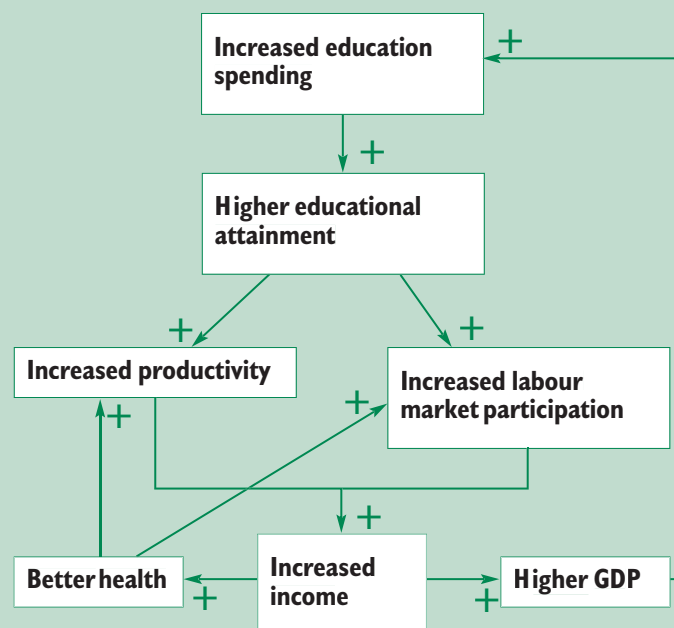
Projections and inter-dependencies 5.18 In addition to the uncertainties surrounding the underlying assumptions of the projections, it also has to be recognised that the projections do not attempt to model potential behavioural changes (by government, businesses or individuals) over time. Indeed, by projecting every spending and revenue line separately, the model does not attempt to capture many important economic interdependencies. Box 5.4 explores the issue of interdependencies and long-term projections in more detail.

Box 5.4: Long-term projections and interdependencies

The model used in this Report has been chosen for its transparency and the ease of interpreting its results. However, it is clear that in the real world there are many interdependencies and feedback effects, which it does not capture.

This Report assumes that behaviour will remain constant over time. An example from the tax side is the implicit assumption that labour supply will not be affected by increases in productivity. In fact, productivity increases could have positive or negative effects on labour supply (through the substitution and income effects respectively) and consequently, positive or negative effects on income tax and National Insurance Contributions.

There are further examples on the spending side. Education spending in particular has been shown to rise with income. In the long term, it might then be reasonable to guess that demand for education will increase by more than demographic factors alone would imply. Further, it has been suggested that education can increase productivity and hence raise the sustainable rate of economic growth. Other studies have also suggested that increased levels of education lead to an increased likelihood of participating in the labour market – another channel through which education could raise GDP. So, there could be a virtuous circle, with economic growth leading to increased spending on education, which in turn increases growth. By increasing incomes, education could also potentially affect health outcomes. Increased incomes have been linked to reductions in both mortality and morbidity at any given age. Through improved health, increasing incomes could have further positive effects on productivity and labour market participation, creating a second virtuous circle.

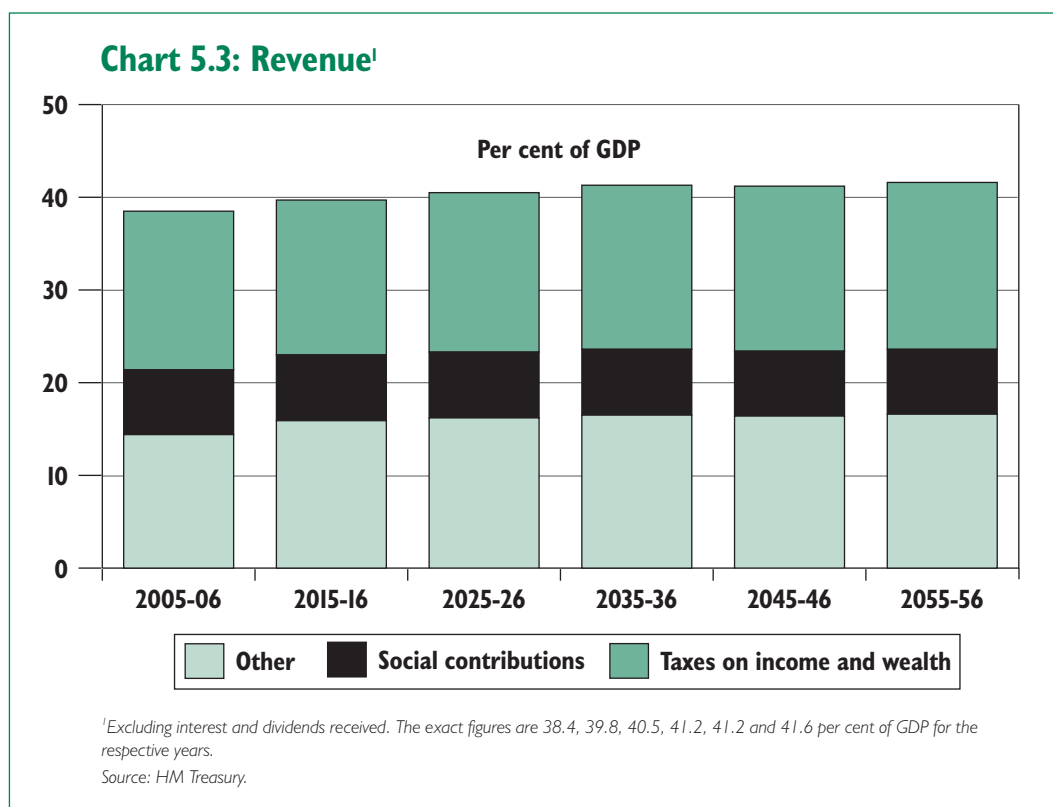


These interdependencies are a large source of uncertainty for long-term projections. Even if it were possible to incorporate them all into a model, the high degree of linkage between variables would mean that if just one of the assumptions were wrong then there would be implications for a large number of linked variables. Therefore, while recognising that interdependencies are a significant source of uncertainty, they are not modelled explicitly in this Report.^a

^a Others have attempted to model some of these interdependencies. See for example *Ageing and the Sustainability of Dutch Public Finances*, van Ewijk et al., March 2006, which uses a general equilibrium approach to reflect the endogeneity of the behaviour of households, firms and pension funds.

Revenue projections

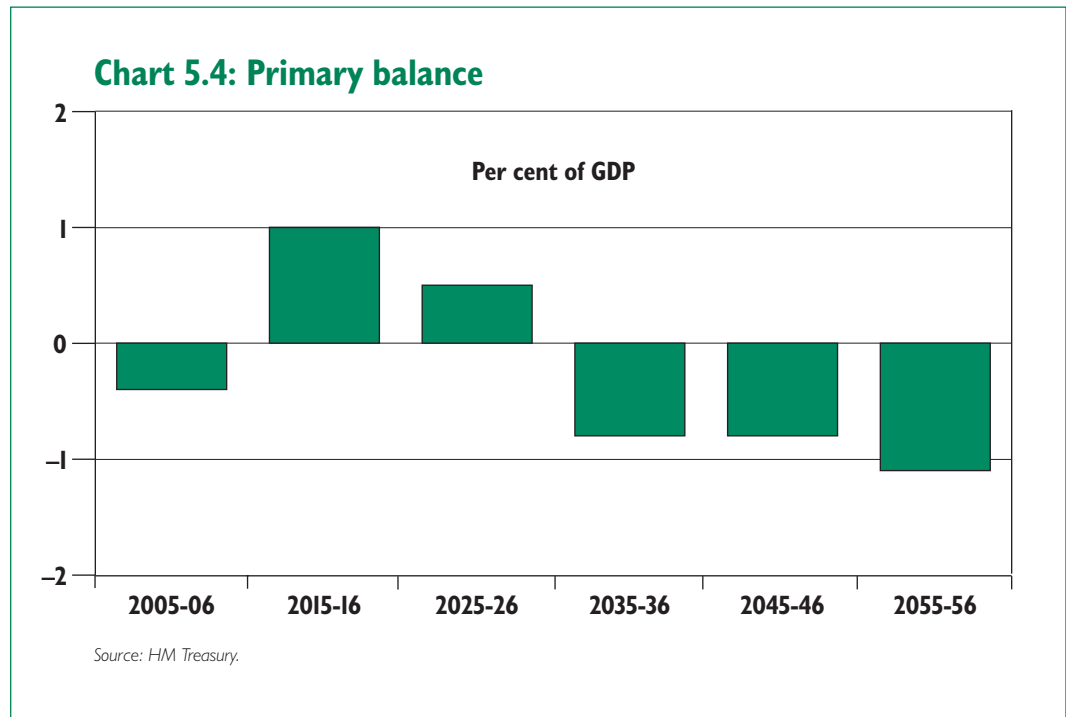
5.19 Chart 5.3 shows that revenue is projected to rise, as a share of GDP, between 2005-06 and 2015-16, reflecting to a large extent the increases forecast over the medium-term horizon.¹⁴ Beyond 2015-16, revenue is projected to rise further, reaching 41.6 per cent of GDP by 2055-56.



5.20 As on the spending side, the revenue projections do not pick up any changes in policy (because policies are assumed to remain unchanged) but changes in the absolute size and the age composition of the population. The projected increase in revenue, as a share of GDP, can therefore be explained. Given the demographic changes discussed in Chapter 2, income tax is projected to rise more quickly than GDP as income tax is paid by people in employment (who contribute to GDP growth) but also by people who are above working age. As the second group is the fastest growing group in society, they are also likely to make a larger (relative and absolute) total contribution to income tax in the future than now. The same argument is valid for Value Added Tax (VAT), with people continuing to consume and hence pay VAT after retirement. It is therefore reasonable to expect that the share of VAT paid by those above working age in total VAT will rise in the coming decades. As this group no longer contributes to GDP growth, VAT, as a share of GDP, should therefore rise. In addition, the revenue projections also capture the projected changes in employment rates (see Chapter 4), which in turn capture the impact of the cohort effect and the proposed changes to the State Pension age.

¹⁴ See 2006 Pre-Budget Report, HM Treasury, December 2006, Annex B.

Primary balance 5.21 As a result of the projected spending and revenue trends, the general government primary balance is projected to be in surplus in 2015-16. Chart 5.4 shows that the primary balance is projected to turn negative in the 2030s and weaken slightly further in later decades.¹⁵ The gradual deterioration in the primary balance in the very long term reflects the fact that spending is projected to increase by slightly more than revenue over the coming decades. The primary balance is projected to remain stable, as a share of GDP, beyond 2055-56.

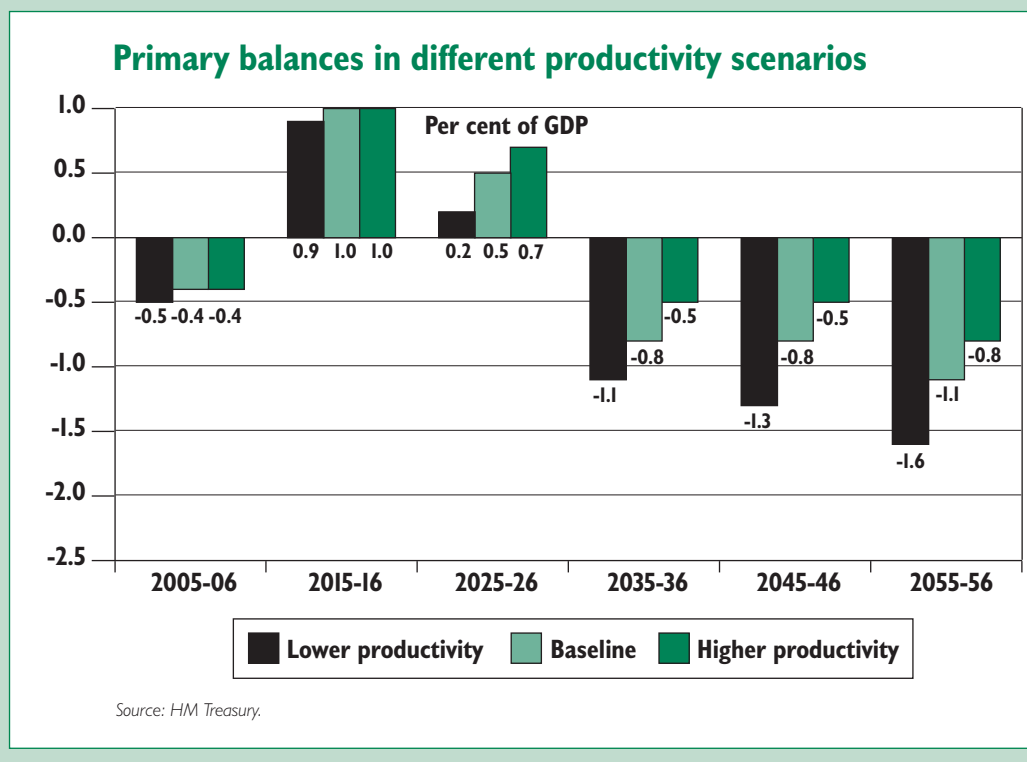


5.22 Box 5.5 presents the primary balances for the three productivity growth scenarios presented in this Report.

¹⁵ To derive the primary balances in Chart 5.4 and in Box 5.5, it is necessary to add general government interest and dividends received to the spending and revenue projections. This follows the International Monetary Fund's *Manual on Fiscal Transparency*. See <http://www.imf.org/external/np/fad/trans/manual/gloss.htm>. Interest and dividends received are assumed to remain constant as a share of GDP beyond the medium term.

Box 5.5: Primary balances in different productivity scenarios

The projected general government primary balance differs slightly between the three productivity scenarios. This is due to the fact that a number of social security spending items are uprated in line with prices rather than earnings. Different productivity growth assumptions will therefore affect the evolution of these spending items, as a share of GDP. The chart below shows the projected evolution of the primary balance in the three scenarios of lower, baseline and higher productivity growth.



ANALYSIS OF THE LONG-TERM FISCAL POSITION USING FORWARD-LOOKING INDICATORS

Intertemporal budget gaps 5.23 Chapter 3 introduced the concept of the intertemporal budget constraint/gap. Table 5.2 presents estimates of the intertemporal budget gap (that is the increase/reduction in tax revenue, as a share of GDP, in 2005-06 (and a proportionate increase/reduction thereafter) to meet the intertemporal budget constraint) under a range of discount rate and productivity rate assumptions.¹⁶ It is likely that higher rates of productivity will be associated with higher real interest/discount rates. The results show that whether revenue (or spending) needs to change at all to maintain intertemporal balance depends to some extent on the discount rate assumption (see Chapter 4 for more information on the discount rate assumption).

¹⁶ As stated in Chapter 3, the adjustment could also include changes on the spending side. In practice, structural reforms will be at least as important as fiscal adjustments given the time horizon concerned.

Table 5.2: Intertemporal budget gaps¹ (per cent of GDP)

Discount rate (per cent)	2½	3	3½
Lower productivity (1¾ per cent)	0	¾	1½
Baseline (2 per cent)	-1	0	¾
Higher productivity (2¼ per cent)	-2¼	-¾	0

¹ Fiscal tightening (or loosening) in 2005-06 and a permanent, proportionate fiscal tightening (or loosening) thereafter needed to ensure intertemporal balance. Rounded to the nearest quarter percentage point.

Fiscal gaps 5.24 The fiscal gap measure introduced in Chapter 3 represents the change in the projected primary balance needed to attain a particular debt target at a particular point in time. A negative fiscal gap, for example, implies that fiscal policy could be loosened relative to that indicated by the projections, while still attaining a particular debt level in the future. Taking the 40 per cent net debt to GDP ratio from the sustainable investment rule as the target, it is therefore possible to use the fiscal gap concept to estimate the primary balance that is consistent with the Government's sustainable investment rule over different time horizons.¹⁷

5.25 Tables 5.3 to 5.5 show the fiscal gaps required under a variety of scenarios where the change in the primary balance is assumed to occur from 2012-13 onwards, that is, beyond the medium-term horizon for fiscal policy.¹⁸ Table 5.3 shows the baseline projections under the different interest rate assumptions.

Table 5.3: Fiscal gaps¹ in baseline scenario² (per cent of GDP)

Interest rate (per cent)	2½	3	3½
Target year			
2025-26	-½	-¼	-¼
2035-36	0	¼	¼
2045-46	¼	½	¾
2055-56	½	¾	¾

¹ Change to primary balance needed to attain net debt of 40 per cent of GDP at end of target year. Rounded to the nearest quarter percentage point.

² 2 per cent productivity growth.

5.26 The results show that the UK public finances are in a solid long-term position. Table 5.3 shows, for example, that if the Government wished to achieve a net debt to GDP ratio of 40 per cent by 2025-26, it could loosen its fiscal stance. Table 5.3 also shows that the Government could tighten fiscal policy by slightly less the lower the assumed interest rate. It should also be emphasised that all the numbers are small, varying between -½ and ¾ per cent of GDP. This needs to be seen in the context of an average absolute difference between forecast and outturn for public sector net borrowing of little over 1 per cent of GDP for the one-year ahead forecast over the period 1970-71 to 2005-06.¹⁹

¹⁷ The fiscal gap calculations in this Report are based on the public sector rather than the general government sector.

This is to increase consistency with the Government's sustainable investment rule, which is defined over the public rather than the general government sector. To derive public sector spending and revenue from the general government-based projections, it is assumed that all spending and revenue items linked to public corporations remain constant as a share of GDP after the medium term. The difference between the general government and public sector numbers is small. Note that for the fiscal gap and the alternative fiscal gap calculations, the primary balance is defined as net borrowing excluding net debt interest payments. This is consistent with the UK's definition of primary balance, which, by excluding interest receipts, yields larger deficits and/or smaller surpluses than the IMF's definition (see footnote 15). See *Analysing UK Fiscal Policy*, HM Treasury, November 1999, page 35. Excluding interest receipts is consistent with calculating the fiscal gaps on a net debt basis.

¹⁸ If the change in the primary balance were assumed to take place earlier than 2012-13, then the implied increases or reductions in the primary balance would be correspondingly smaller.

¹⁹ 2006 *End of year fiscal report*, HM Treasury, December 2006.

5.27 Tables 5.4 and 5.5 illustrate the effect of assuming lower and higher productivity growth respectively than in the baseline scenario. The figures suggest that the fiscal gap calculations are robust to changes in the productivity growth rate assumption, with the required policy action only slightly different from those under the baseline projections.

Table 5.4: Fiscal gaps¹ in lower productivity scenario² (per cent of GDP)

Interest rate (per cent)	2½	3	3½
Target year			
2025-26	-¼	0	0
2035-36	¼	½	¾
2045-46	¾	¾	1
2055-56	1	1	1¼

¹ Change to primary balance needed to attain net debt of 40 per cent of GDP at end of target year. Rounded to the nearest quarter percentage point.

² 1¼ per cent productivity growth.

Table 5.5: Fiscal gaps¹ in higher productivity scenario² (per cent of GDP)

Interest rate (per cent)	2½	3	3½
Target year			
2025-26	-¾	-½	-¼
2035-36	-¼	0	0
2045-46	0	¼	½
2055-56	¼	½	½

¹ Change to primary balance needed to attain net debt of 40 per cent of GDP at end of target year. Rounded to the nearest quarter percentage point.

² 2¼ per cent productivity growth.

COMPARISON WITH PREVIOUS RESULTS

Spending and revenue **5.28** The results presented in this year's Report show differences but also similarities to the results shown in the 2005 Report.

Spending

- By the mid 2050s, total spending, as a share of GDP, is projected to be slightly less than projected in the 2005 Report, as marginally larger projected increases in total age-related spending are offset by larger falls in other spending.
- Comparing the results published in previous Long-term public finance reports, it can be seen that the projections have remained reasonably stable. One factor driving changes to the projections has been updated population projections; life expectancies for males and females have been revised up in every year that new projections have been used for the Report (2002, 2004 and 2005). A further factor has been methodological improvements. For example, before 2004 public service pensions were not modelled explicitly; they were simply a component of the 'other' spending category. From 2004, GAD projections of the combined costs of NHS, teachers and civil service pension schemes (grossed up to cover all public service schemes) were used in the

Report.²⁰ In this year's Report, the methodology has been further refined and now GAD models all public service schemes individually. Changes are also driven by revisions to the medium-term public finance projections and by updates to the spending and revenue profiles.²¹

Revenue

- Revenue is projected to rise by less, as a share of GDP, than in last year's Report. This is because the increase in the State Pension age proposed in the Government's White Paper on pensions is assumed to bring about higher rates of labour market participation and therefore increase projected GDP levels. While revenue items such as income tax and national insurance contributions will also be affected by the proposed increase in the State Pension age (as they are assumed to grow broadly in line with employment), the majority of revenue items will be unaffected as they are not adjusted for projected employment growth. As a result, the impact of the proposed increase in the State Pension age upon overall revenue is projected to be smaller than the effect upon GDP, bringing about a smaller increase in revenue as a share of GDP.

²⁰ See 2004 *Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, December 2004, page 43, for more detail.

²¹ See Chapter 4 for more detail.

Fiscal indicators 5.29 The fiscal indicators are similar to those presented in last year's Report.

- The intertemporal budget gap is projected to be either larger or smaller than the 2005 estimates depending on the productivity assumption and discount rate used. Whereas the deficit on the primary balance was projected to decline in the second half of the century in previous Long-term public finance reports,²² it is now projected to remain more or less stable, as a share of GDP, at its 2050s level.
- The fiscal gap calculations show that the required tightening in the primary balance to stabilise net debt at 40 per cent of GDP in a specific target year is little different from in last year's Report. It should also be emphasised that the fiscal gaps are small, and should be seen in the context of an average absolute difference between forecast and outturn for public sector net borrowing of a little over 1 per cent of GDP for the one-year ahead forecast over the period 1970-71 to 2005-06.²³
- The illustrative long-term fiscal projections, updating those presented in Annex A of the 2006 Economic and Fiscal Strategy Report (EFSR),²⁴ show that the UK's public finances are sustainable in the long term, confirming the previous projections. Box 5.6 provides details of the updated illustrative long-term fiscal projections, which are based on the medium-term public finance projections as presented in the 2006 Pre-Budget Report.

²² See for example, 2004 *Long-term public finance report: an analysis of fiscal sustainability*, HM Treasury, December 2004.

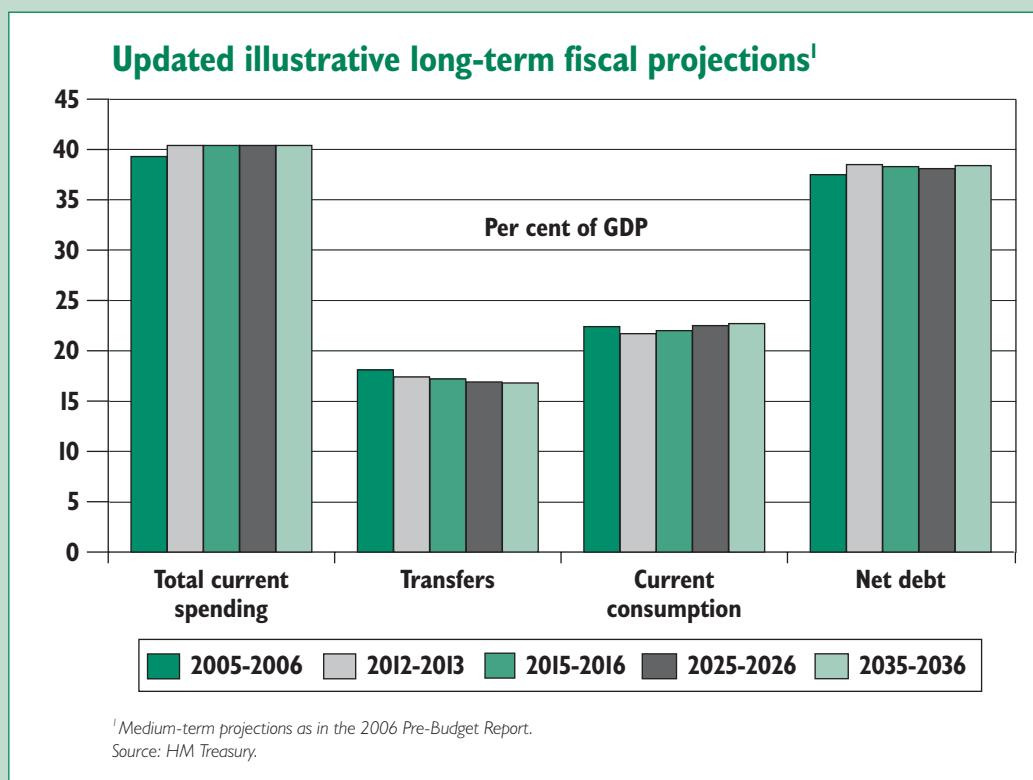
²³ 2006 *End of year fiscal report*, HM Treasury, December 2006.

²⁴ Economic and Fiscal Strategy Report in Budget 2006: *A strong and strengthening economy: Investing in Britain's future*, HM Treasury, March 2006.

Box 5.6: Updated illustrative long-term fiscal projections

The chart below presents the results of the updated projections, following the approach used in Annex A of the Economic and Fiscal Strategy Report (EFSR).^a Transfers now include pensions on post-White Paper policies. The chart shows that transfers, as a share of GDP, are projected to fall slightly between 2012-13 and 2035-36 as gradual increases in state pension spending are offset by relatively lower other transfers such as non-pension social benefits.

The chart also shows that current consumption is projected to remain more or less the same, as a share of GDP, over the coming decades, ensuring that resources are available to meet potential future spending pressures. Finally, the net debt to GDP ratio is projected to remain below 40 per cent until the end of the projection horizon, implying that the sustainable investment rule is met.



The illustrative long-term fiscal projections presented here therefore differ only slightly from those presented in Annex A of the 2006 EFSR, indicating that the UK’s public finances are sustainable over the long term.

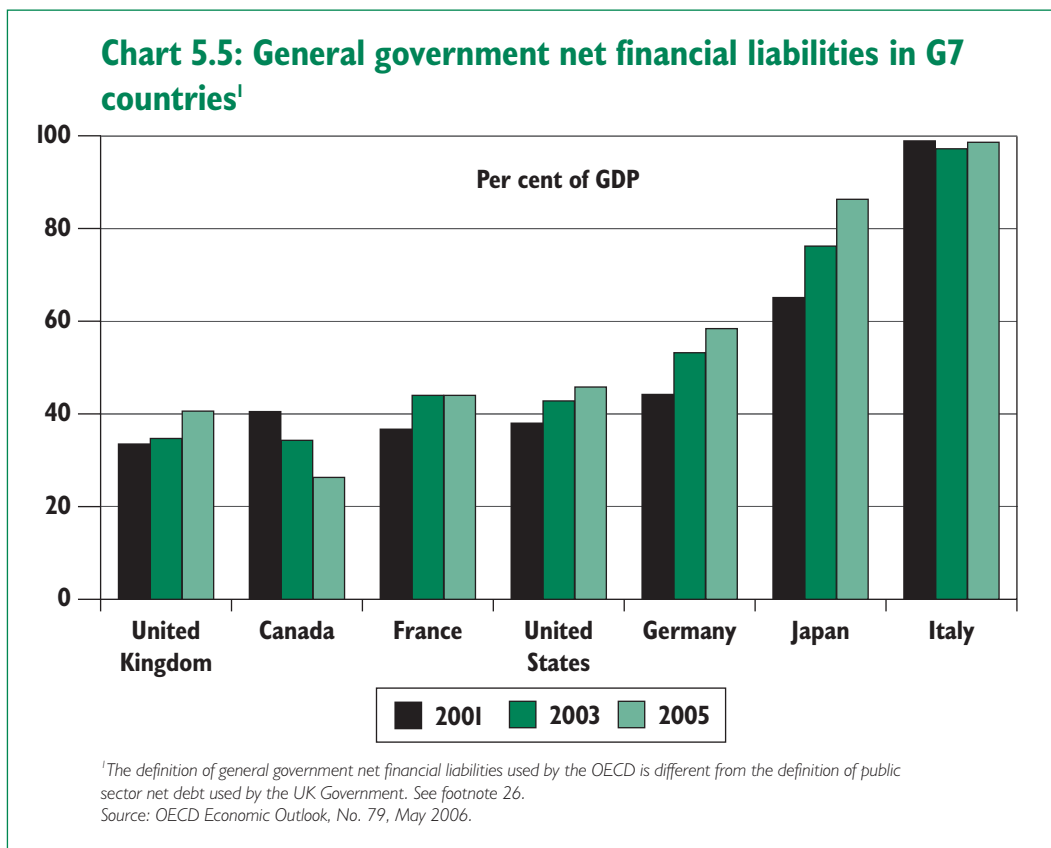
^a The modelling and long-term macroeconomic assumptions remain unchanged from those used for the illustrative long-term fiscal projections presented in Annex A of the 2006 EFSR.

INTERNATIONAL COMPARISONS

5.30 International comparisons suggest that the UK’s long-term fiscal position is relatively strong compared with those of other developed countries facing challenges from ageing populations, including many EU countries and the United States. As the OECD notes in its *Economic Survey of the United Kingdom*: “Unlike the situation in many OECD countries, future fiscal costs are not projected to rise significantly as the population ages”.²⁵

²⁵ OECD *Economic Survey of the United Kingdom 2005*, OECD, October 2005, page 11.

5.31 Chart 5.5 shows that the UK's ratio of general government net financial liabilities to GDP remained among the lowest of the G7 countries in 2005.²⁶



Fiscal challenges in EU Member States

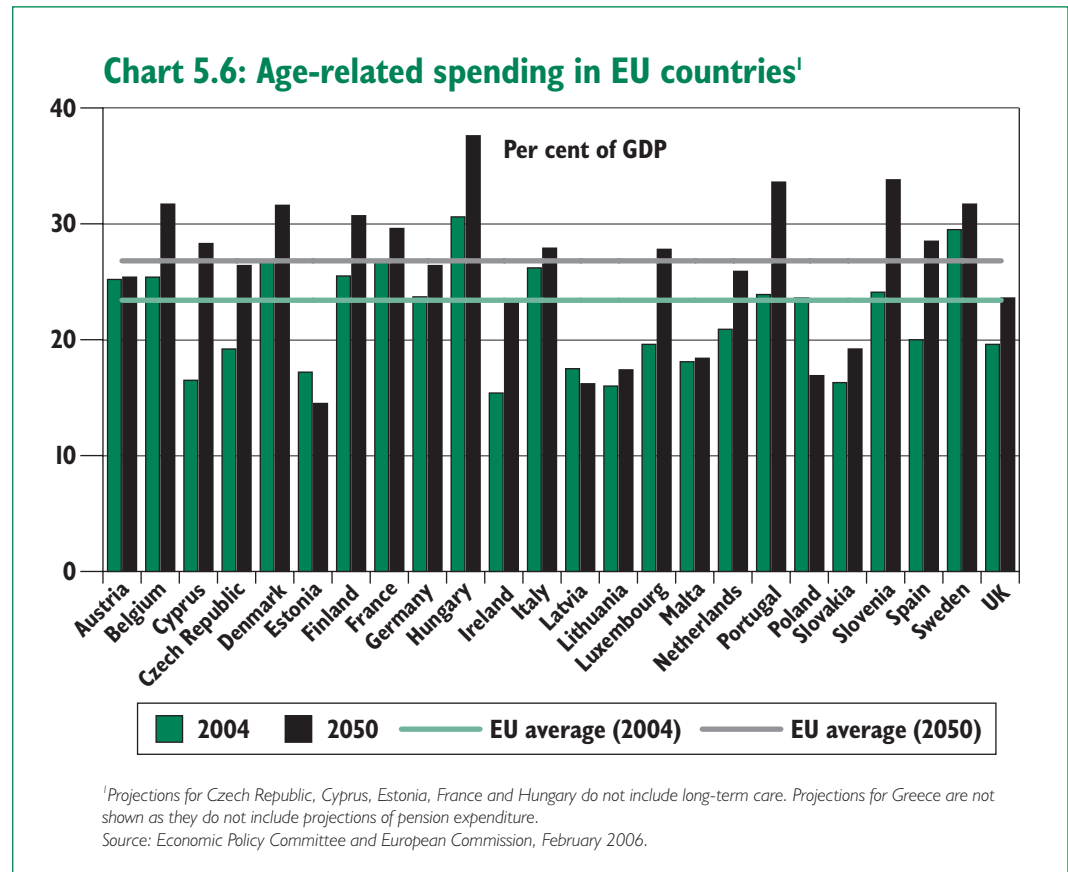
5.32 Many European countries face significant challenges from ageing populations. The EPC has identified four major demographic trends that will affect the populations of EU countries over the coming decades: low fertility rates, the ageing of the post-war baby-boom generation, projected increases in life expectancy at birth, and projected falls in net migration.

5.33 Overall, the EU population is expected to shrink slightly over the next 50 years. Net migration will not be sufficient to offset below-replacement fertility rates. The population will also age significantly. The demographic old-age dependency ratio is set to reach 51 per cent by 2050. The first negative impact of the ageing of the population on employment levels will begin to be felt around 2018. From 2018, the positive employment effect of increasing female participation will be outweighed by the negative effect of the baby-boom generation entering retirement.²⁷

²⁶ Note that the OECD definition of general government net financial liabilities differs from the Government's measure of public sector net debt in a number of respects. In particular, the OECD measure excludes public corporations but uses a wider definition of general government assets and liabilities, values gilts according to their market value rather than their nominal value and uses different reference periods (debt is measured at the end of the calendar year as opposed to the end of the financial year, and GDP for the previous year is used rather than GDP centred on the debt period).

²⁷ The 2005 projections of age-related expenditure (2004-50) for the EU-25 Member States: underlying assumptions and projection methodologies, Economic Policy Committee and European Commission, November 2005.

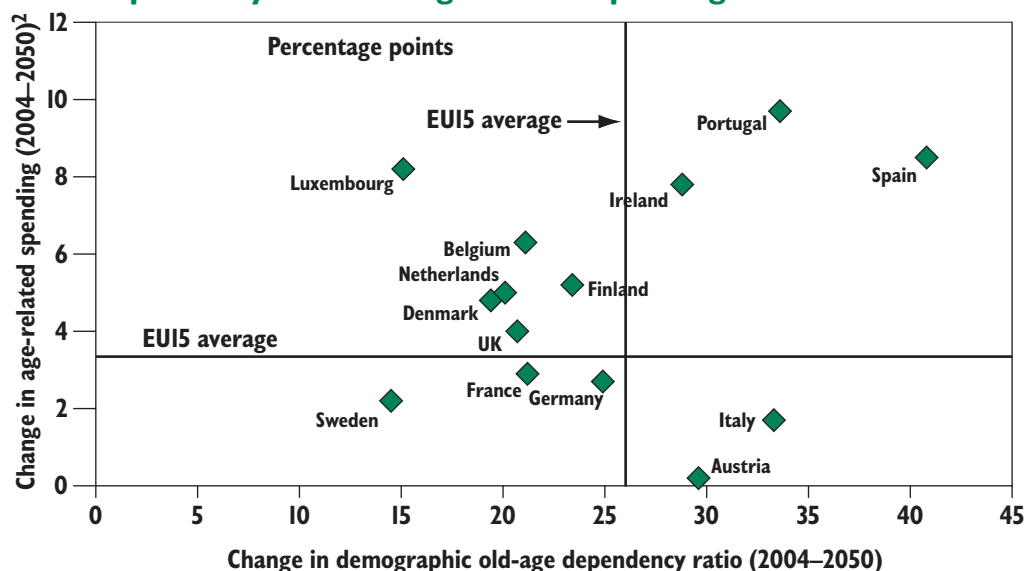
5.34 In February 2006, the EPC produced a new set of age-related expenditure projections for the 25 Member States for the period 2004 to 2050. The projections cover pensions, health care, long-term care, education, unemployment transfers and, in some cases, social contributions.²⁸ Chart 5.6 shows projected age-related spending over the coming decades in EU countries. It shows that age-related spending in the UK is projected to rise moderately over the next five decades – in contrast with substantial projected increases in some other countries – and that it will be similar in 2050 to the EU average now.



5.35 Chart 5.7 suggests that there is not a strong positive relationship between projected increases in the demographic old-age dependency ratio and projected increases in age-related spending for the EU15 Member States. Existing institutional structures and policy settings are likely to play a much greater role than the magnitude of ageing in determining how much age-related spending will increase in the EU15.

²⁸ *The impact of ageing on public expenditure: projections for the EU25 Member States on pensions, health care, long-term care, education and unemployment transfers (2004-2050)*, Economic Policy Committee and European Commission, February 2006.

Chart 5.7: Projected changes in demographic old-age dependency ratio and age-related spending in EU15¹



¹Greece is excluded since data are not available for pension expenditures.
²Comparisons of projections need to be treated with caution as some include the cost of long-term care within health projections.
 Source: Economic Policy Committee and European Commission, February 2006.

5.36 The long-term projections presented in this Report are based on assumptions that differ in a number of ways from the EPC’s assumptions. The key differences in the underlying data used in the two sets of projections are the demographic projections, employment levels and productivity growth rates.

Comparing the UK and EPC projections

5.37 This Report and the EPC use different population projections,²⁹ which affects their respective employment profiles and GDP projections. In addition, this Report explicitly models the effects of raising the State Pension age on employment. This Report assumes that productivity growth of 2 per cent per year.³⁰ By contrast, the EPC assumes labour productivity growth of 2.1 per cent between 2004 and 2030, falling to 1.7 per cent between 2031 and 2050. As well as different assumptions, the EPC’s budgetary projections also use different modelling and projection methodologies for health, long-term care and education expenditures. For the pension projections, the same methodologies are used for both sets of projections (though using different underlying assumptions, as explained above). Box 5.7 gives further explanation of the approach taken by the EPC to modelling health expenditure.

²⁹ This Report uses the official UK population projections produced by the Government Actuary’s Department (GAD); the EPC uses a variant of the Eurostat baseline population projections.

³⁰ In line with the historic average.

Box 5.7: Health scenarios used by the European Union's Economic Policy Committee

For its 2006 projections of age-related expenditure the European Union's Economic Policy Committee (EPC) looked at different scenarios, using a variety of assumptions. The six main scenarios are described below.^a All scenarios use the Eurostat baseline population projection, adapted for EPC purposes.

Main scenarios

1. **Pure ageing:** It assumes that health spending per capita for each given age remains constant, which implies that as people live longer their healthy life expectancy will not increase. Costs are assumed to evolve in line with GDP.
2. **Constant health:** This scenario uses the more optimistic assumption that all gains in life expectancy will be spent in good health. The health spending age profile thus shifts outwards as life expectancy increases.
3. **Death-related costs:** The profiles in this scenario are constructed based on the probability that an individual will die in the near future. This reflects the fact that a large proportion of the total health expenditure on any given individual will be in their last year of life, regardless of their age at death.
4. **Income elasticity of demand:** As scenario 1, except that it assumes an income elasticity of demand for health care greater than unity. This reflects observed historical trends.
5. **Unit costs – GDP per worker:** In this scenario unit costs increase in line with GDP per worker, rather than GDP per capita.
6. **Reference:** This central reference scenario incorporates death-related costs, greater-than-unity income elasticity and developments in healthy life expectancies that lie between the pure ageing and constant health scenarios.

For the EU15 (weighted) average, scenario 5, which assumes health unit costs rising in line with GDP per worker, gives the greatest increase in health spending between 2004 and 2050. Scenario 2, which assumes that all gains in longevity will be spent in good health, gives the smallest increase. The reference scenario is close to halfway between these two extremes.

^a Additional scenarios are presented in Annex 6 of the EPC's report. See *The impact of ageing on public expenditure: projections for the EU25 Member States on pensions, health care, long-term care, education and unemployment transfers (2004-2050)*, Economic Policy Committee and European Commission, February 2006.

Netherlands 5.38 Individual EU Member States have also carried out a considerable amount of work on long-term fiscal sustainability. For example, in March 2006 the Netherlands Bureau for Economic Policy Analysis (CPB) produced an update of its 2000 assessment of fiscal sustainability.³¹ The report is unusual in using a general equilibrium approach, which explicitly tries to model the fact that individuals' savings and labour supply decisions are influenced by the interest rate, the wage rate and the tax rate on labour supply.

³¹ *Ageing and the Sustainability of Dutch Public Finances*, van Eijk, C et al., Netherlands Bureau for Economic Policy Analysis, March 2006.

5.39 The CPB's 2006 sustainability assessment is more pessimistic than in 2000 mainly due to falling returns to pension investments. The report argues that developments in equity prices and interest rates have more than offset the Dutch government's policy measures, which were intended to tackle the budgetary effects of the ageing population. The report concludes that an increasing old-age dependency ratio will put pressure on the public finances and budgetary reforms will be necessary in order to maintain fiscal sustainability in the future.

5.40 Chapter 2 of this Report noted that ageing is a trend seen in most developed countries, including those outside the EU. However, as Chart 5.7 demonstrates, those EU15 Member States with more pronounced ageing processes do not necessarily face greater challenges in achieving long-term fiscal sustainability. The importance of institutional structures and policy settings in influencing increases in age-related spending is also shown by the experiences of developed countries outside the EU.

US 5.41 For example, as shown in Chapter 2, the US is ageing slowly by comparison with other developed countries. Nonetheless, fiscal imbalances are projected to arise in the US over the coming decades. The US Congressional Budget Office (CBO) regularly publishes long-term analysis covering a wide range of topics. For example, the CBO projects that spending on social security will increase from 4.2 per cent of GDP in 2005 to 6.4 per cent by 2050, while spending on Medicare and Medicaid (the two principal public health care schemes) is projected (for the 'intermediate-spending path') to rise from just over 4 per cent of GDP in 2005 to 12.6 per cent by 2050, due to a combination of demographic and non-demographic factors.³²

Japan 5.42 Japan faces a particularly dramatic ageing of its population. By 2050, just over a third of the total population are projected to be aged 65 years or over. Recent projections by the Japanese Ministry of Finance³³ suggest a rise in social security payments from 23.9 per cent to 26.1 per cent of National Income between 2006 and 2025. Its already high levels of debt make Japan's sustainability challenge more difficult, with the Ministry acknowledging that "...Japan's gross debt has rapidly worsened to reach the worst level among developed countries."³⁴ Reforms to tackle the issues of debt sustainability and an ageing population include significant increases in contributions to healthcare costs for citizens aged 70 years and over with a certain income level from October 2006 and the creation of a specific health care system for elderly people in April 2008.

Canada 5.43 Canada is also projected to experience an increase in its demographic old-age dependency ratio over the coming decades (see Chapter 2). This will place pressure on the public finances. The International Monetary Fund therefore suggests that long-term fiscal analysis should be carried out on an annual basis in order to focus attention on the importance of debt reduction. Its other recommendations include setting debt objectives over a five to ten year horizon in order to allow some flexibility regarding debt consolidation in any one year.³⁵

Australia 5.44 In March 2005 the Australian Government Productivity Commission published a report on the economic implications of ageing in Australia.³⁶ According to the report, between 2003-04 and 2044-45: "...spending is projected to rise by about 6½ percentage points of GDP,

³² *The Long-Term Budget Outlook*, Congressional Budget Office, December 2005.

³³ *Current Japanese Fiscal Conditions and Issues to be Considered*, Ministry of Finance of Japan, 2006.

³⁴ *Ibid*, page 9.

³⁵ *Canada: 2006 Article IV Consultation-Staff Report; Staff Supplement; and Public Information Notice on the Executive Board Discussion*, International Monetary Fund, June 2006, page 17.

³⁶ *Economic Implications of an Ageing Australia*, Australian Government Productivity Commission, March 2005.

of which most is health and aged care”.³⁷ The report projects that during this period there will be an increase in fiscal pressure (the extent to which government spending outpaces revenue growth) of 5.7 percentage points of GDP. This is slightly higher than was found earlier by the Australian Treasury’s first intergenerational report (published in May 2002).³⁸ The Australian Treasury is now in the process of updating its intergenerational report, in line with the Australian Charter of Budget Honesty, which requires that an intergenerational report be published at least once every five years.³⁹

New Zealand 5.45 In June 2006, New Zealand published a report on its long-term fiscal position.⁴⁰ The report follows both top-down and bottom-up approaches. The report uses the top-down approach to examine a range of scenarios. For example, if the government chose to keep gross debt close to its current level of 20 per cent of GDP and all the adjustment to rising age-related expenditure were made on the tax side, then the tax-to-GDP ratio would have to rise from 32 per cent to 35 per cent. Following the bottom-up approach and assuming no changes in policy, the report projects gross debt rising from the current 20 per cent of GDP to close to 100 per cent by 2050. Assets in the New Zealand Superannuation fund would offset this to a large extent, so that net debt would rise much less dramatically. Primary spending is predicted to increase by seven percentage points between 2005 and 2050. Increased health spending drives most of the increase.

CONCLUSIONS

5.46 The Report provides updated bottom-up projections of spending and revenue. Total spending is projected to increase by marginally less, as a share of GDP, than in last year’s Report. On the revenue side, revenue is projected to continue to rise, as a share of GDP, over the coming decades but by also marginally less than projected in last year’s Report.

5.47 As in previous years, this Report also assesses the long-term sustainability of the public finances using a series of fiscal sustainability indicators, including the intertemporal budget gap/constraint and fiscal gaps. The updated results confirm the findings of previous reports that the UK fiscal position is sustainable in the long term on the basis of current policies and that the UK is in a strong position relative to many other developed countries to face the challenges of an ageing society.

5.48 In addition, the Report updates the illustrative long-term fiscal projections presented in Annex A of the EFSR and confirms the findings in Budget 2006. Given the assumed profile for tax revenue and the projected profile for transfers, current consumption can grow at around the same rate as GDP growth in the long term while meeting the Government’s golden rule. In addition, public sector net investment can grow close to the economy’s growth rate over the projection period without jeopardising the sustainable investment rule. Given the modelling assumptions, the net debt to GDP is projected to remain below 40 per cent in the long term.

³⁷ *Economic Implications of an Ageing Australia*, Australian Government Productivity Commission, March 2005, page 306.

³⁸ *Intergenerational Report 2002-03*, Department of the Treasury of Australia, May 2002.

³⁹ *Charter of Budget Honesty Act 1998*, section 20.

⁴⁰ *New Zealand’s Long-Term Fiscal Position*, New Zealand Treasury, June 2006.

⁴¹ *Security in Retirement: towards a new pensions system*, Department for Work and Pensions, May 2006.

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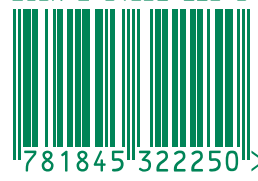
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LIST OF ABBREVIATIONS

CBO	Congressional Budget Office
CFS	Completed family size
COFOG	Classification of function of government
CPB	The Netherlands Bureau for Economic Policy Analysis
CSR	Comprehensive Spending Review
DWP	Department for Work and Pensions
EFSR	Economic and Fiscal Strategy Report
EPC	Economic Policy Committee
EU	European Union
EU15	European Union Member States prior to the accession of ten candidate countries on 1 May 2004
EU25	All European Union Member States as of 2006
GAAP	Generally Accepted Accounting Practice
GAD	Government Actuary's Department
GDP	Gross Domestic Product
HCHS	Hospital and Community Health Services
IBC	Intertemporal budget constraint
IMF	International Monetary Fund
NICs	National Insurance Contributions
NIESR	National Institute of Economic and Social Research
NHS	National Health Service
OECD	Organisation for Economic Co-operation and Development
ONS	Office for National Statistics
PDV	Present discounted value
UN	United Nations
US	United States of America
VAT	Value Added Tax
WGA	Whole of Government Accounts

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