Office for
Budget Responsibility

Fiscal sustainability report

June 2015

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Foreword

The Office for Budget Responsibility (OBR) was created in 2010 to provide independent and authoritative analysis of the UK's public finances. As part of this role, the Budget Responsibility and National Audit Act 2011 requires us to produce "*an analysis of the sustainability of the public finances*" once a year.

Our approach to analysing this issue is twofold:

- first, we look at the fiscal impact of *past* public sector activity, as reflected in the assets and liabilities that it has accumulated on its balance sheet; and

- second, we look at the potential impact of *future* public sector activity, by projecting how spending and revenues may evolve over the next 50 years – and the impact this would have on public sector net debt.

Broadly speaking, the fiscal position is unsustainable if the public sector is on course to absorb an ever-growing share of national income simply to pay the interest on its accumulated debt. This notion of sustainability can be quantified in a number of ways, which we discuss in the report. On these measures, the central projection in each of our reports over the past five years has pointed to an unsustainable fiscal position over the long term.

It is important to emphasise that the long-term outlook for public spending and revenues is subject to huge uncertainties. Even backward-looking balance sheet measures are clouded by difficulties of definition and measurement. The long-term figures presented here should be seen as illustrative projections, not precise forecasts. Policymakers need to be aware of these uncertainties, but should not use them as an excuse for ignoring the long-term challenges that lie ahead.

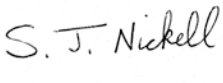
As the Government has asked us to produce an additional economic and fiscal forecast to accompany its summer Budget, we have slightly reduced the scope of this *Fiscal sustainability report*. In particular, we have not included in-depth annexes on specific subjects.

The analysis and projections in this report represent the collective view of the three independent members of the OBR's Budget Responsibility Committee. We take full responsibility for the judgements that underpin them and for the conclusions we have reached. We have, of course, been supported in this by the full-time staff of the OBR, to whom we are as usual enormously grateful.

We have also drawn on the help and expertise of officials across government, including the Department for Work and Pensions, HM Revenue and Customs, HM Treasury, the Department of Energy and Climate Change, the Department for Business, Innovation and Skills, the Government Actuary's Department, the Department of Health and the Personal Social Services Research Unit at the London School of Economics, and the Office for National Statistics.

We provided the Chancellor of the Exchequer with a draft set of our projections and conclusions on 28 June, to give him the opportunity to decide whether he wished to make policy decisions that we would be able to incorporate in the final version. He did not. We provided a full and final copy of the report 24 hours prior to publication, in line with the standard pre-release access arrangements. At no point in the process did we come under any pressure from Ministers, special advisers or officials to alter any of our analysis or conclusions.

We hope that this report is of use and interest to readers. Feedback would be very welcome to OBRfeedback@obr.gsi.gov.uk.



Robert Chote Steve Nickell Graham Parker

The Budget Responsibility Committee

Executive summary

Overview

1 In the *Fiscal sustainability report* (*FSR*) we look beyond the medium-term forecast horizon of our twice-yearly *Economic and fiscal outlooks* (*EFOs*) and ask whether the UK's public finances are likely to be sustainable over the longer term.

2 In doing so our approach is twofold:

- first, we look at the fiscal impact of *past* government activity, as reflected in the assets and liabilities on the public sector's balance sheet; and
- second, we look at the potential fiscal impact of *future* government activity, by making 50-year projections of all public spending, revenues and significant financial transactions, such as government loans to students.

3 These projections suggest that the public finances are likely to come under pressure over the longer term, primarily as the result of an ageing population. Under our definition of unchanged policy, the Government would end up having to spend more as a share of national income on age-related items such as pensions and health care, but the same demographic trends would leave government revenues roughly stable.

4 In the absence of offsetting tax rises or spending cuts this would widen budget deficits over time and eventually put public sector net debt on an unsustainable upward trajectory. The fiscal challenge from an ageing population is common to many developed nations – a conclusion echoed in the European Commission's 2015 *Ageing Report*.

5 Separate from our central projections, we also look at the long-term sustainability of particular tax revenues. We have updated our assessment of the outlook for oil and gas receipts, which we have revised down again.

6 Long-term projections such as these are highly uncertain and the results we present here should be seen as illustrative, not precise forecasts. We quantify some of the uncertainties through sensitivity analyses, particularly relating to demographic trends and health spending.

7 It is important to emphasise that we focus here on the additional fiscal tightening that might be necessary beyond our medium-term forecast horizon, which currently ends in 2019-20. The report should not be taken to imply that the substantial fiscal consolidation already in the pipeline for the next five years should be made even bigger over that period.

8 That said, policymakers and would-be policymakers should certainly think carefully about the long-term consequences of any policies they introduce or propose in the short term. And they should give thought too to the policy choices that will confront them once the current consolidation is complete.

Public sector balance sheets

9 We assess the fiscal impact of past government activity by looking at the assets and liabilities on the public sector's balance sheet. We look at two presentations of the balance sheet: the National Accounts and the 2013-14 Whole of Government Accounts (WGA).

10 The last two governments both set targets for the National Accounts measure of public sector net debt (PSND) – the difference between the public sector's liabilities and its liquid financial assets. At the end of 2014-15, PSND was £1,484 billion, equivalent to 80.4 per cent of GDP or £55,600 per household. Our forecast for the level of PSND has risen since last year's *FSR*, but that revision reflects accounting changes implemented by the Office for National Statistics (ONS). We expect that – thanks to significant planned asset sales during 2015-16 – PSND will peak a year earlier than was forecast last year, in 2014-15.

11 National Accounts balance sheet measures do not include liabilities arising from the future consequences of past government activities, for example the pension rights that have been accrued by public sector workers. More information on liabilities of this sort is available in the WGA, which are produced using commercial accounting rules.

12 According to the 2013-14 WGA, as of the end of March 2014:

- the net present value of future **public service pension payments** arising from past employment was £1,302 billion or 73 per cent of GDP. This is £130 billion higher than a year earlier. While some of this reflects an increase in the expected future flow of pension payments – due to an additional year of public employment – once again, a lower discount rate used to convert the projected flow into a one-off net present value has added to the measured liability;

- liabilities include £142 billion (8.0 per cent of GDP) in **provisions** for future costs that are expected (but not certain) to arise. Total provisions have increased by £11 billion since last year's WGA. As in last year's WGA, the two largest sources of provisions – for future nuclear decommissioning costs (particularly at Sellafield) and clinical negligence claims – increased significantly, by £7.6 billion and £3.0 billion respectively. Repeated and substantial increases in these provisions suggest they could become significant future pressures on public spending; and

- £63 billion (3.6 per cent of GDP) of quantifiable **contingent liabilities** had been identified – costs that could arise in the future, but where the probability of them doing so is estimated at less than 50 per cent (so they are not included in the headline total of liabilities). The £25 billion reduction compared with last year was more than accounted for by the removal of the £30 billion contingent liability associated with the

UK's capital subscription to the European Investment Bank and the cancellation of the £8 billion contingent capital facility available to the Royal Bank of Scotland (RBS). This was partly offset by a doubling of HMRC's contingent liability associated with ongoing tax litigation cases, after an adverse judgement in a 'lead' case that prompted a number of 'follower' cases to be classified as contingent liabilities.

13 Overall gross liabilities in the WGA increased by £264 billion over the year to reach £3,189 billion at the end of March 2014. This was explained by the net deficit recorded during the year, as expenditure exceeded revenue, plus the accumulation of additional public service pension liabilities described above.

14 Unlike PSND, the WGA balance sheet also includes the value of tangible and intangible fixed assets – for example the road network and the electromagnetic spectrum respectively. These assets are estimated at £769 billion or 43.3 per cent of GDP at the end of March 2014. They have increased by £12 billion since last year's WGA. The overall net liability in the WGA was £1,852 billion or 104.4 per cent of GDP at the end of March 2014, up £224 billion on the previous year's restated results. This compares with PSND of £1,402 billion or 79.1 per cent of GDP at the same date.

15 One theme in this year's report is that the direct effects of the late-2000s financial crisis on the public sector balance sheet are now declining:

- the PSND inc measure of debt – which includes all net debt of the public sector banks, not just the government borrowing that financed purchase of equity in those banks – is now £0.3 trillion above the headline PSND ex measure, down from a peak of almost £1.5 trillion at the end of 2008. That reflects the public sector banks shrinking their assets and liabilities, but also Lloyds Banking Group being reclassified to the private sector as the Government has reduced its equity stake;

- the WGA contingent liabilities that the Government classifies as associated with financial sector interventions have fallen to £0.3 billion from £9.9 billion a year earlier, as the £8 billion contingent capital facility available to RBS was withdrawn. While these contingent liabilities have fallen to almost zero, there will remain a significant, if unquantifiable, fiscal risk related to the financial system (as is the case for all governments); and

- our medium-term forecast shows PSND ex falling in 2015-16 thanks to the sale of £20 billion of assets that the Government holds as a result of interventions made during the financial crisis – notably mortgage assets held by NRAM and much of its remaining stake in Lloyds. As these sales exchange one form of asset (e.g. mortgages or shares) for another (e.g. cash), they could have little or no effect on WGA net liabilities. That contrasts with the effect on PSND, where the assets being sold are not netted off net debt because they are illiquid, but the proceeds of the sale would either increase liquid assets if held as cash or reduce gross liabilities if used to pay down debt.

16 While these direct effects on the public sector balance sheet are now diminishing quite rapidly, the indirect effect via the recession that accompanied the financial crisis and, more importantly, the large and persistent hit to the economy's potential to produce national income continues. Our latest medium-term forecast is consistent with the hit to potential output relative to the pre-crisis expectation being 11 per cent by 2013-14 rising to 14 per cent by 2019-20, helping to explain why the structural fiscal deficit remained at 4.2 per cent of GDP (£76 billion) in 2014-15, despite five years of fiscal consolidation.

17 There are significant limits to what public sector balance sheets alone can tell us about fiscal sustainability. In particular, balance sheet measures look only at the impact of past government activity. They do not include the present value of future spending that we know future governments will wish to undertake, for example on health, education and state pension provision. And, just as importantly, they exclude the public sector's most valuable financial asset – its ability to levy future taxes. This means that we should not overstate the significance of the fact that PSND and the WGA balance sheet both show the public sector's liabilities outstripping its assets. Across countries and time, this has usually been the case.

Long-term fiscal projections

18 We assess the potential fiscal impact of future government activity by making long-term projections of revenue, spending and financial transactions on an assumption of 'unchanged policy', as best we can define it. In doing so, we assume that spending and revenues initially evolve over the next five years as we forecast in our March 2015 *EFO*. This allows us to focus on long-term trends rather than making fresh revisions to the medium-term forecast.

Demographic and economic assumptions

19 Demographic change is a key long-term pressure on the public finances. Like many developed nations, the UK is projected to have an 'ageing population' over the next few decades, with the ratio of the elderly to those of working age rising. This reflects increasing life expectancy, particularly among older people, relatively low fertility rates, and the retirement of the post-war 'baby boom'.

20 We base our analysis on detailed population projections produced by the ONS. In last year's report, we used the ONS 'low migration' variant of the projections, which we considered reasonable given international trends and the direction of Government policy. But with net migration having been much higher than expected over the past year, we have switched to the 'principal' variant – as we did for our medium-term forecasts in the March *EFO*. This is consistent with annual net migration of 165,000 a year rather than 105,000 a year, though it is still well below the 318,000 estimate of net migration in 2014. The effect of this change in assumption is to increase the size of the population by the end of our projections by 5.6 per cent, with the working-age population up 6.5 per cent and the over-65 population up 3.4 per cent. This therefore reduces the old-age dependency ratio relative to last year's projections.

21 As regards the economy, we assume in our central projection that whole economy productivity growth will average 2.2 per cent a year, in line with its pre-crisis average rate. As in each *FSR* to date, we assume CPI inflation of 2.0 per cent (consistent with the Bank of England's target). But we have made small revisions to other price assumptions, revising our GDP deflator growth assumption up to 2.3 per cent (from 2.2 per cent) and our long-term RPI inflation assumption down to 3.0 per cent (from 3.3 per cent). We have also revised up the assumed additional effect of the triple lock on pension uprating, which is informed by an estimate of its average cost had it been in place since the early 1990s.

Defining 'unchanged' policy

22 Fiscal sustainability analysis is designed to identify whether and when changes in government policy may be necessary to move the public finances from an unsustainable to a sustainable path. To make this judgement, we must first define what we mean by 'unchanged' policy over the long term.

23 Government policy is rarely clearly defined over the long term. In many cases, simply assuming that a stated medium-term policy continues for 50 years would be unrealistic. Where policy is not clearly defined over the long term, the *Charter for Budget Responsibility* allows us to make appropriate assumptions. These are set out clearly in the report. Consistent with the Charter, we only include the impact of policy announcements in our central projections when they can be quantified with "*reasonable accuracy*".

24 In our central projections, our assumption for unchanged policy is that beyond 2019-20 underlying age-specific spending on public services, such as health and education, rises with per capita GDP. As detailed spending plans are only available to 2015-16, we have to make an assumption about the composition of spending on public services in 2019-20:

- our central projection assumes that all types of departmental spending fall proportionately from 2015-16. This implies health and education spending, the main age-related elements of departmental spending, being reduced by 1.0 per cent and 0.6 per cent of GDP respectively between 2015-16 and 2019-20 (equivalent to £22 billion and £14 billion in nominal terms in 2019-20); or

- we could assume for these three years – as we do beyond 2019-20 – that per capita spending by age and gender is fixed relative to potential earnings. Under this scenario, health and education spending would be broadly flat as a share of GDP over these four years. The Government would then have to find cuts in other spending of 1.9 per cent of GDP (£42 billion in nominal terms in 2019-20) to stick to the March 2015 policy assumption for total spending.

25 We assume that most tax thresholds and benefits are uprated in line with earnings growth rather than inflation beyond the medium term, which provides a more neutral baseline for long-term projections. An inflation-based assumption would, other things equal, imply an ever-rising ratio of tax to national income and an ever-falling ratio of benefit payments to average earnings in the rest of the economy.

Results of our projections

26 Having defined unchanged policy, we apply our demographic and economic assumptions to produce projections of the public finances over the next 50 years. When comparing this year's results with our 2014 *FSR*, we have restated last year's projections to be as consistent as possible with the latest National Accounts treatment of the public finances and GDP.

Expenditure

27 An ageing population will put upward pressure on public spending. We project total non-interest public spending to rise from 33.6 per cent of GDP at the end of our medium-term forecast in 2019-20, to 38.0 percent of GDP by 2060-61, before falling slightly to 37.8 per cent of GDP in 2064-65. That would represent an overall increase of 4.2 per cent of GDP – equivalent to £79 billion in today's terms.

28 The main drivers are upward pressures on key items of age-related spending:

- **health spending** rises from 6.2 per cent of GDP in 2019-20 to 8.0 per cent of GDP in 2064-65, rising smoothly as the population ages. This profile is little changed from last year, with spending slightly lower by the end of the period due to the effect of higher migration on the old-age dependency ratio. A larger, but slightly younger, population means higher health spending and higher GDP in cash terms, but with the effect on GDP proportionately larger;

- **state pension costs** increase from 5.1 per cent of GDP in 2019-20 to 7.3 per cent of GDP in 2064-65 as the population ages. This profile is also little changed from last year, but due to the broadly offsetting effects of a higher assumed cost of uprating (in line with the triple lock) and a lower old-age dependency ratio (associated with higher net migration); and

- **long-term social care costs** rise from 1.2 per cent of GDP in 2019-20 to 2.2 per cent of GDP in 2064-65, reflecting the ageing of the population and the Government's announcement of a lifetime cap on certain long-term care expenses incurred by individuals. The projections are little changed from last year.

29 Our conclusions about age-related pressures on public spending in the UK are similar to those in the European Commission's 2015 *Ageing Report*, which was published in May. The Commission's results suggest these pressures in the UK are close to the average projected across the EU.

Revenue

30 Demographic factors will have less impact on revenues than on spending. Non-interest revenues are projected to be broadly flat across the projection period as a share of GDP. In our central projections, those revenue streams that are not affected by demographics are explicitly held constant as a share of GDP – even though non-demographic factors may affect them in the future.

31 In our detailed analysis this year, we have again updated our long-term projections of North Sea revenues, in light of the substantial drop in oil prices since last year and the changes to the policy regime announced in Autumn Statement 2014 and Budget 2015. Our latest medium-term receipts forecast – the starting point for our long-term projection – is for receipts of just £0.7 billion in 2019-20. That compares with the £3.5 billion in 2018-19 that underpinned last year's projections.

32 Our latest projection shows that the effect of lower oil and gas prices and production has been partly offset by lower expenditure to leave the implied pre-tax profits from the North Sea positive, but relatively low. The effects of accumulated losses reducing the effective tax rate paid by companies in the North Sea, plus the repayments associated with decommissioning costs, mean that in our central projection just £2 billion of receipts will be raised in total between 2020-21 and 2040-41. That is down from around £37 billion in last year's projection.

33 As we always stress, North Sea revenues have been the most volatile receipts stream and are subject to large forecast errors, even over the short term. These projections are therefore subject to considerable uncertainty. It is quite possible that the industry's response to conditions that currently prevail could lead to very different outcomes.

Financial transactions

34 In order to move from spending and revenue projections to an assessment of the outlook for public sector net debt, we need also to take public sector financial transactions into account. These affect net debt directly, without affecting accrued spending or borrowing.

35 For the majority of financial transactions, we assume that the net effect is zero. Student loans are an important exception. The Government's decision to sell the pre-2012 student loan book exchanges some future loan repayments for upfront sale proceeds, while crystallising the loss associated with interest rate and write-off subsidies. We have lowered our medium-term forecast for student numbers, which knocks through to our long-term projections. That slows the accumulation of debt over the near term, as it immediately cuts outlays but only gradually lowers repayments. Its ultimate effect is to lower the stock of debt in the long term, but not its profile from year to year. But this is eventually outweighed by other changes, such as lowering the assumption on prepayments, so that the peak impact on debt is 8.8 per cent of GDP by the late-2030s – 0.5 per cent lower than last year's figure (adjusted for National Accounts methodology changes) – and the impact at the end of the 50-year horizon is 8.0 per cent of GDP – 0.1 per cent higher than projected last year (again, on an adjusted basis).

36 On top of the sale of student loans, the Government has announced the sale of mortgage assets of NRAM and its shareholding in Lloyds Banking Group that are together expected to reduce PSND by £20 billion in 2015-16. The sale of financial assets is classified as a financial transaction in the public finances data. So sales reduce public sector net debt directly and indirectly via net borrowing (because interest is paid on a smaller stock of debt), but typically they also have offsetting effects when the government loses a related income stream. This is the case in each of these sales – forgoing repayments on student loans and

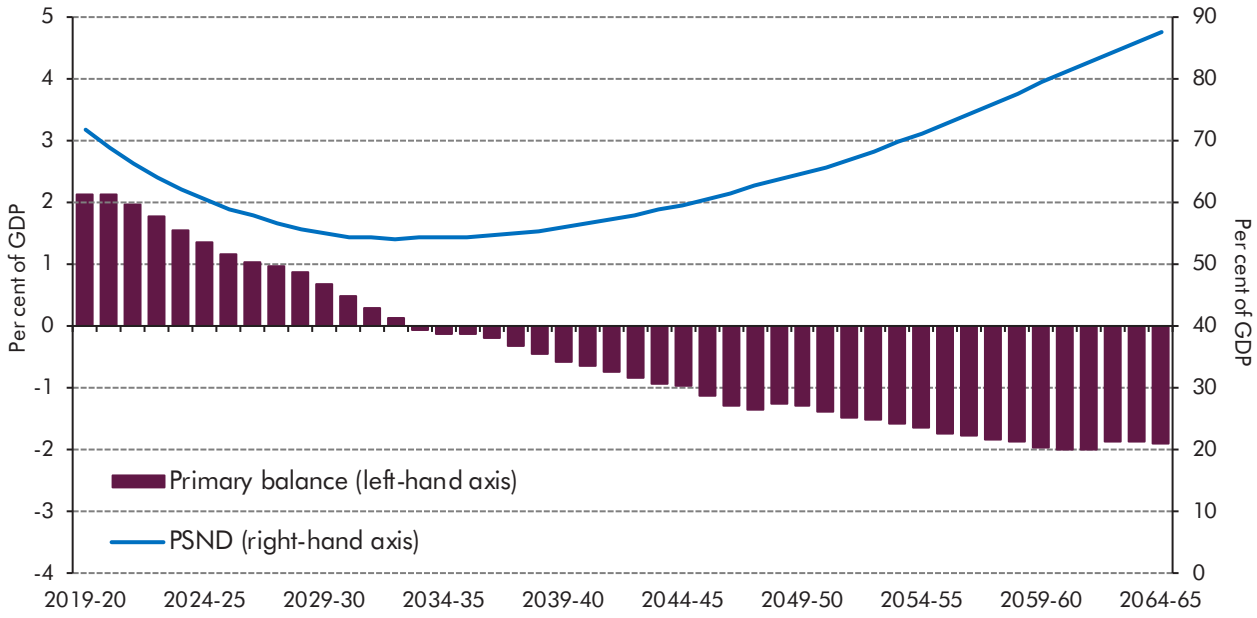
NRAM mortgages, and dividends from Lloyds shares. Over the long term, therefore, the net impact of asset sales on net debt is significantly less than the sale price.

Projections of the primary balance and public sector net debt

37 Our central projections show public spending increasing as a share of national income beyond the medium-term forecast horizon, gradually rising towards and then exceeding receipts. As a result, the primary budget balance (the difference between non-interest revenues and spending that is the key to the public sector's debt dynamics) is projected to move from a surplus of 2.1 per cent of GDP in 2019-20 to rough balance in the mid-2030s and then to a deficit of 1.9 per cent of GDP in 2064-65 – an overall deterioration of 4.0 per cent of GDP, equivalent to £76 billion in today's terms.

38 Taking this and our projection of financial transactions into account, PSND is projected to fall from its medium-term peak of just over 80 per cent of GDP in 2014-15 to 54 per cent of GDP in the early 2030s, before rising to 87 per cent of GDP in 2064-65. Beyond this point, debt would remain on a rising path.

Chart 1: Central projection of the primary balance and PSND



Source: OBR

39 The primary balance and PSND at the end of the projection period are little changed from last year's projections. That reflects the net effect of a number of offsetting factors:

- classification changes have had a small effect on the primary balance, but a larger effect on net debt in the short term that diminishes over the projection period;
- the primary surplus at the end of our medium-term forecast is lower than last year, which pushes through to the long-term projections, raising net debt. The main factors explaining this difference relate to the Coalition Government's spending assumption

that was applied in our March 2015 forecast. Lower debt interest spending implied higher departmental spending within a total spending envelope that had been tightened up to 2018-19. In addition, the spending assumption for 2019-20 implied departmental spending rising as a share of GDP in that year; and

- the effect of a looser fiscal position at the end of the medium term was broadly offset by our decision to switch our central projections from the ONS low migration population projections to the principal projections. That reduces the old-age dependency ratio relative to last year, reducing the extent to which age-related spending rises as a share of GDP in the long term.

40 Needless to say, there are huge uncertainties around any projections that extend this far into the future. Small changes to underlying assumptions can have large effects on the projections once they have been cumulated across many decades. We therefore test these sensitivities using a number of different scenarios.

41 The eventual increase in PSND would be greater than in our central projection if long-term interest rates turned out to be higher relative to economic growth, if the age structure of the population was older, or if net inward migration (which is concentrated among people of working age) was lower than in our central projection.

42 Given the importance of health spending in the demographic challenge to fiscal sustainability, the rate of productivity growth in the sector and the level of health spending at the start of the projection are also important assumptions. If productivity growth was weaker in the health sector than in the rest of the economy, and health spending was to be increased more quickly to compensate, then in our illustrative scenario health spending would rise by a further 5.0 per cent of GDP by 2064-65. This would see PSND rise substantially faster. If we assumed health spending moved in line with demographics from 2015-16, rather than being cut in line with other departmental spending, it would be 1.2 per cent of GDP higher in 2019-20. This would be compounded by the demographics to increase health (and therefore total) spending by a further 0.4 per cent of GDP by 2064-65.

Summary indicators of fiscal sustainability

43 In our central projections, and under most of the variants we calculate, on current policy we would expect the budget deficit to widen sufficiently over the long term to put public sector net debt on a rising trajectory as a share of national income. This would be unsustainable.

44 Summary indicators of sustainability can be used to illustrate the scale of the challenge more rigorously and to quantify the tax increases and/or spending cuts necessary to return the public finances to different definitions of sustainability. We focus on a measure of sustainability that asks how big a permanent spending cut or tax increase would be necessary to move public sector net debt to a particular desired level at a particular chosen date. This is referred to as the 'fiscal gap'.

45 There is no consensus on what would be an optimal level for the public debt to GDP ratio. So for illustration, we calculate the additional fiscal tightening necessary from 2020-21 to return PSND to 20, 40 or 60 per cent of GDP at the end of our projections in 2064-65.

46 Under our central projections, a once-and-for-all policy tightening of 1.1 per cent of GDP in 2020-21 (£20 billion in today's terms) would see the debt ratio reach 40 per cent of GDP in 2064-65. But this is less than the 1.9 per cent of GDP required to stabilise debt over the longer term and so the debt ratio would continue rising beyond the target date. Tightening policy by 0.4 per cent of GDP a decade would see the debt ratio fall more slowly to begin with, but the overall tightening would be large enough to stabilise the debt ratio at around the target level and prevent it from taking off again. These conclusions are little changed from last year. Targeting debt ratios of 20 and 60 per cent of GDP would require larger and smaller adjustments respectively.

47 These calculations depend significantly on the health of the public finances at the end of our medium-term forecast. If the structural budget balance was 1 per cent of GDP weaker or stronger in 2019-20 than we forecast in the *EFO*, the necessary tightening would be bigger or smaller by the same amount. The sensitivity factors that we identified in the previous section as posing upward or downward risks to our central projections for PSND similarly pose upward or downward risks to our estimates of fiscal gaps.

1 Introduction

A framework for analysing fiscal sustainability

1.1 This chapter sets out the framework we use in this report to analyse fiscal sustainability. We examine the fiscal consequences of:

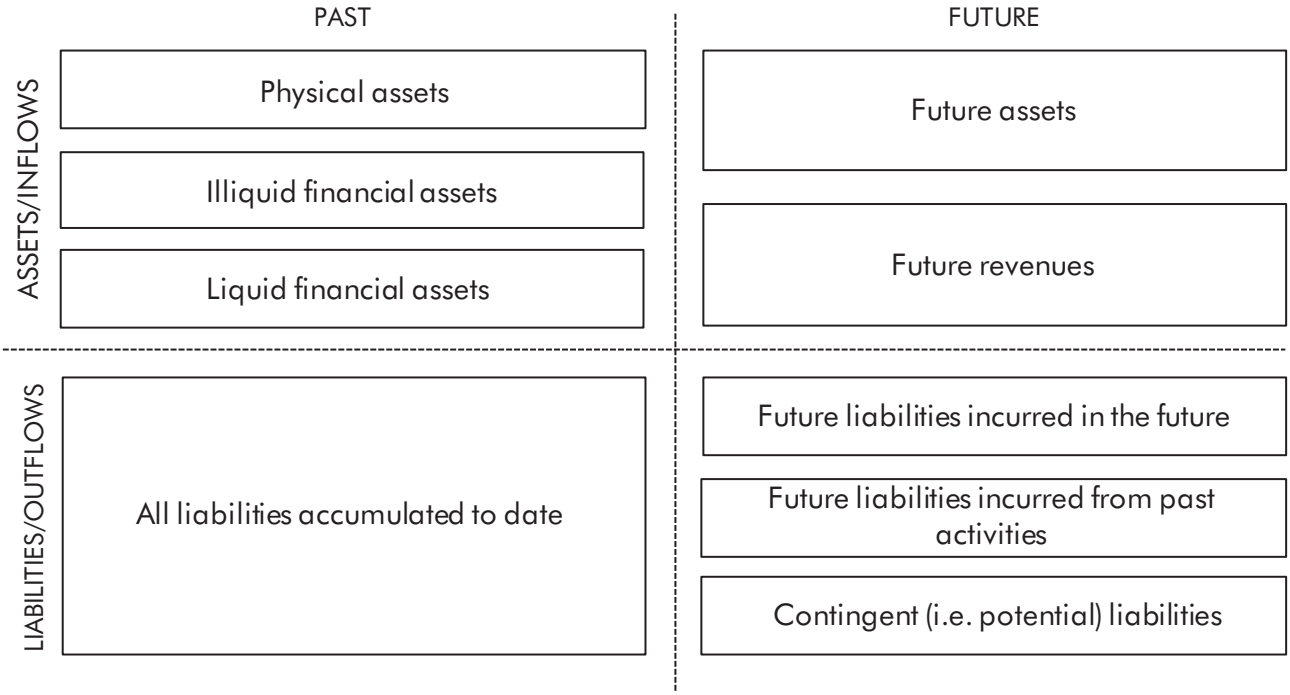
- **past government activity**, as a result of which it has accumulated assets (physical and financial) and liabilities. Past activity also creates some reasonably certain future financial flows, for example contractually agreed public service pension payments. The government's past activity also creates 'contingent liabilities', where there is a non-zero but less than 50 per cent probability that it will face some cost in the future, such as making good a loan guarantee; and

- **future government activity**, which will involve future expenditures, some for investment in assets, but mostly to pay for public services and transfer payments. It will also involve receipt of future revenues, mostly from taxation. The government may also find itself in possession of valuable assets it has not had to pay to accumulate, for example access to the electromagnetic spectrum that it can auction.

1.2 Assessing the long-term sustainability of the public finances in our *Fiscal sustainability reports (FSR)* involves summarising the fiscal consequences of some or all of this past and future activity. Figure 1.1 illustrates the potential elements.[1]

[1] Adapted from HM Treasury (2003) and International Federation of Accountants (2009).

Figure 1.1: Government activity: past and future, stocks and flows



1.3 In summarising the fiscal consequences of government activity, we can focus on flows (future revenues and spending, including those generated by existing assets and liabilities) or stocks (existing assets and liabilities, plus the present value of expected future revenues and spending). In principle, these approaches should tell the same story. In practice it appears they rarely do, because of the widely varying coverage of the different summary stock and flow measures used in policy presentation and discussion. We try in this report to tell a coherent story using both approaches and to warn against drawing inappropriate conclusions from an unrepresentative subset of government activity.

1.4 Our analysis of stocks focuses on measures of the public sector balance sheet. These provide a snapshot of the fiscal consequences of the government's past activity at any point in time, by providing information on its stock of assets and liabilities. Balance sheets provide interesting information, but their usefulness as an indicator of long-term fiscal sustainability is limited by their backward-looking nature. They exclude the future cost of known expenditure commitments and, crucially, the present value of future revenues. The greatest financial asset of any government is its ability to levy future taxes.

1.5 Transparency regarding the public sector balance sheet is very important. But in assessing fiscal sustainability, we place more emphasis on our analysis of future flows. We make projections of future government expenditure, revenues and financial transactions, and we assess their implications for fiscal sustainability, taking into account the initial balance sheet position. We then consider indicators that can be used to summarise fiscal sustainability on the basis of such projections.

1.6 Another advantage of looking at flows of spending and revenue is that they provide a more intuitive guide to the nature of the potential policy response: the bulk of any adjustment to

move the public finances from an unsustainable path to a sustainable one is likely to take the form of increasing revenues and/or reducing spending rather than selling assets or directly reducing the value of liabilities.

1.7 In analysing these stocks and flows, there is a trade-off between completeness and certainty. Balance sheets provide reasonably reliable estimates of assets and liabilities related to past activity (though even here there are a number of difficulties with estimation and data availability). But they are incomplete, as they do not account for many elements of future activity. Long-term projections paint a fuller picture, but are extremely uncertain.

1.8 Recognising this trade-off, we examine both balance sheet information and future projections. The remainder of this introduction explains in more detail how the material in subsequent chapters of the report is structured around this analytical framework.

Past activity: the public sector balance sheet

1.9 Chapter 2 examines the impact of past government activity using measures of the public sector balance sheet. We consider three alternative presentations of the public sector balance sheet – two from the National Accounts framework and one from the private-sector-style Whole of Government Accounts (WGA).

1.10 National Accounts measures are produced by the Office for National Statistics (ONS) and have been used by the current and previous governments to assess the fiscal position. Public sector net debt (PSND) has been used in particular as a key target indicator of fiscal health. This is defined as the public sector's consolidated gross debt less its liquid financial assets – that is, those assets that could be readily sold. A broader balance sheet measure is public sector net worth (PSNW), which compares the public sector's liabilities with *all* its assets, so including the physical and illiquid financial assets that are excluded from PSND. (In this year's report we focus on a slightly narrower measure – general government net worth – because PSNW data are currently unavailable.)

1.11 As shown in Figures 1.2 and 1.3 – and explained in Chapter 2 – both measures capture an entirely backward-looking subset of the government's activities. In particular, PSND has been criticised as a measure of the public sector's financial health (and a similar criticism would apply to PSNW) because it excludes future liabilities and contingent liabilities arising out of past activity. These include:

- future public service pension payments, where the liability to pay the pension was incurred as a result of past employment;
- capital payments to PFI providers and other payments from previous long-term contracts – the National Accounts classify most PFI deals as 'off balance sheet';
- the future costs of student loans, to the extent that previous loans or the costs of servicing those loans are not fully recovered; and

- provisions, contingencies, guarantees and other risks of future costs that might materialise as a result of past activities.

Figure 1.2: Coverage of public sector net debt

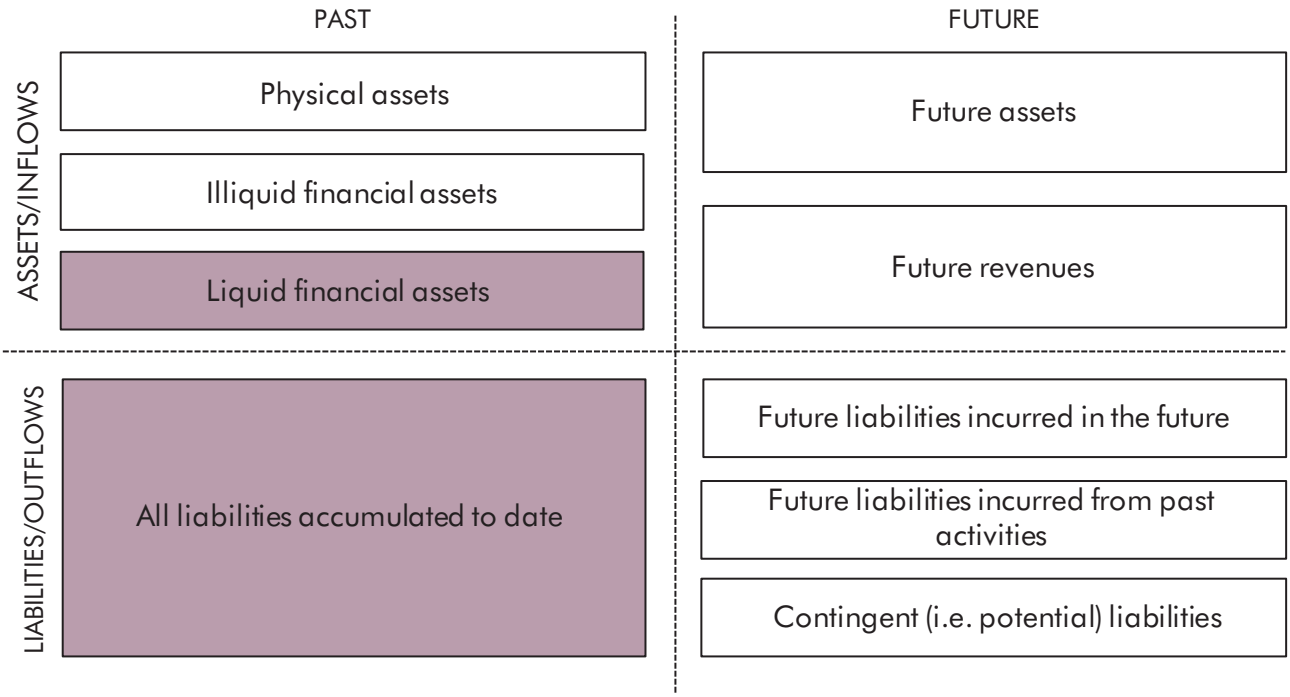
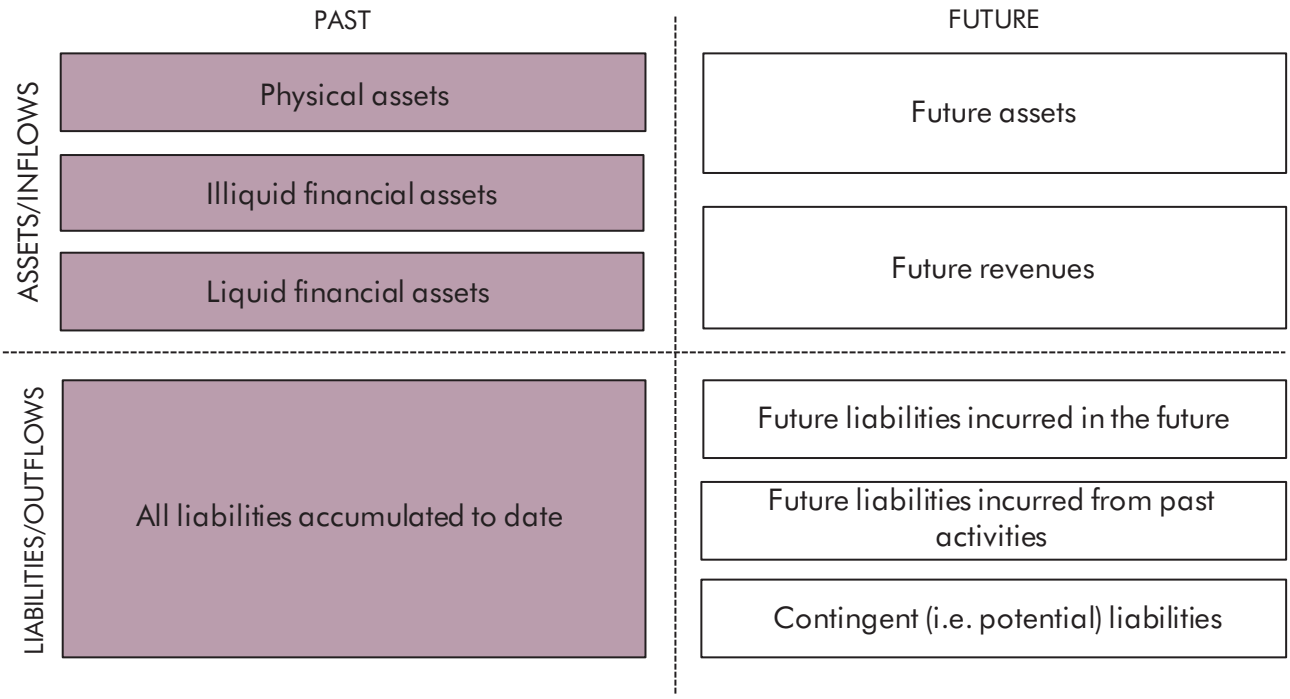


Figure 1.3: Coverage of public sector net worth

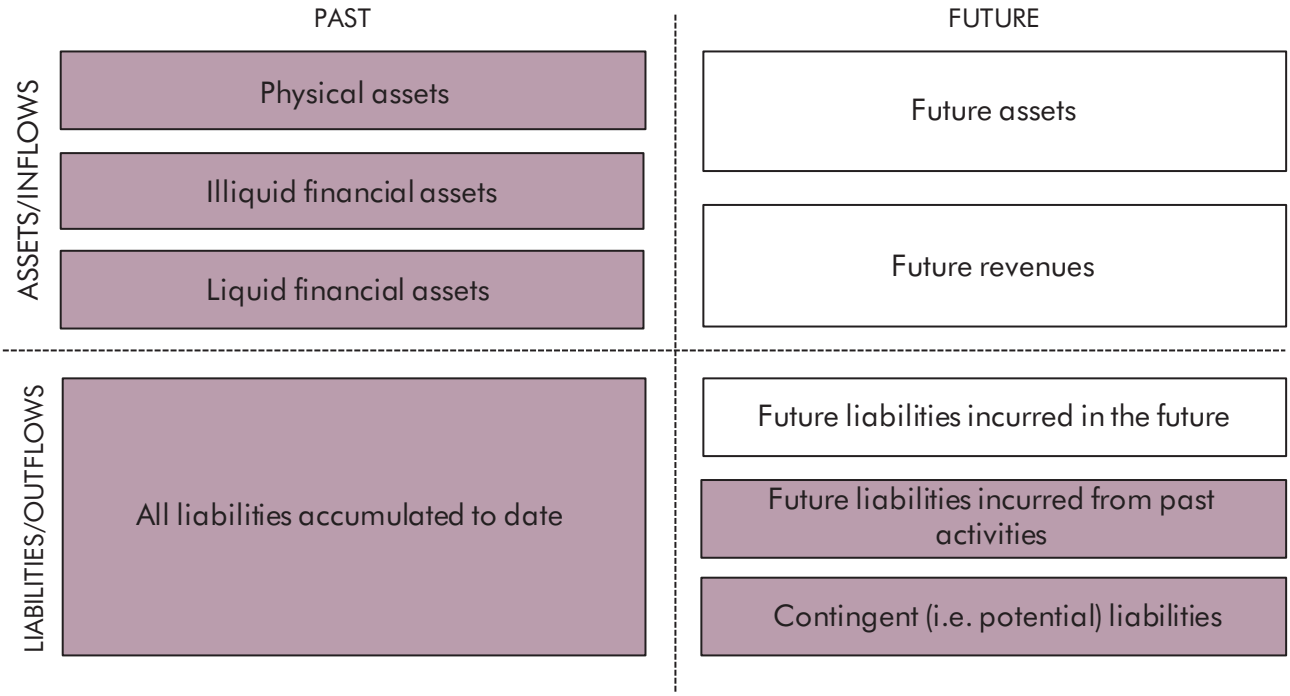


1.12 Some of these gaps are addressed in the WGA. These are consolidated financial statements for the public sector, compiled in line with international financial reporting standards as adapted for the public sector. They include an accruals-based balance sheet.

1.13 As Figure 1.4 shows, the WGA captures a wider, but still incomplete, range of the activities identified above. They include financial and non-financial assets and liabilities, plus some costs incurred in the past for which the payments will occur in the future. In particular, they take account of net pension liabilities, provisions and commitments for finance leases such as PFI.

1.14 This is the fifth year in which the WGA have been published. We focus on the latest figures for 2013-14 and the restated figures for 2012-13. Prior years have not been restated, so the full 5-year time series is not directly comparable. In the comparisons we make, it is important to bear in mind that present value estimates of future financial flows, such as those in the WGA, are very sensitive to the choice of discount rates used to convert the projected flows into one-off upfront values on the balance sheet. Changes to discount rates between WGA publications can significantly change estimates of assets and liabilities, even in the absence of changes to underlying cash flows.

Figure 1.4: Coverage of the WGA measure of net liabilities



Future activity: long-term spending and revenue projections

1.15 Balance sheets contain useful information on the fiscal consequences of past government activity, including its implications for some future cash flows. But to assess long-term sustainability, we also need to understand how future government activity might affect the balance sheet. In doing so, we focus on the effect of these flows on the future path of PSND.

1.16 In Chapter 3, we analyse future flows by undertaking a bottom-up analysis, aggregating long-term projections of different spending and revenue streams as shares of GDP, plus future financial transactions, on the presumption of unchanged government policy. This is a

similar approach to the one taken by the Treasury prior to 2010 in its *Long-term public finance reports* and by a number of other fiscal bodies around the world.

1.17 The first five years of our projections are consistent with the March 2015 *Economic and fiscal outlook (EFO)*, so as to focus on longer-term influences rather than fresh revisions to our assessment of the short and medium-term outlook.

1.18 Using long-term projections of this type provides a relatively comprehensive way of assessing fiscal sustainability. It takes into account items such as the cost of public service pensions, but without the same sensitivity to the choice of discount rate as in the balance sheet approach. It also takes into account the government's many non-contractual but nonetheless meaningful ongoing spending commitments. For example, while not contractually obliged to do so, the government is likely to wish to continue providing state education and health care. Crucially, the approach also recognises that the government has the ability to raise future tax revenues.

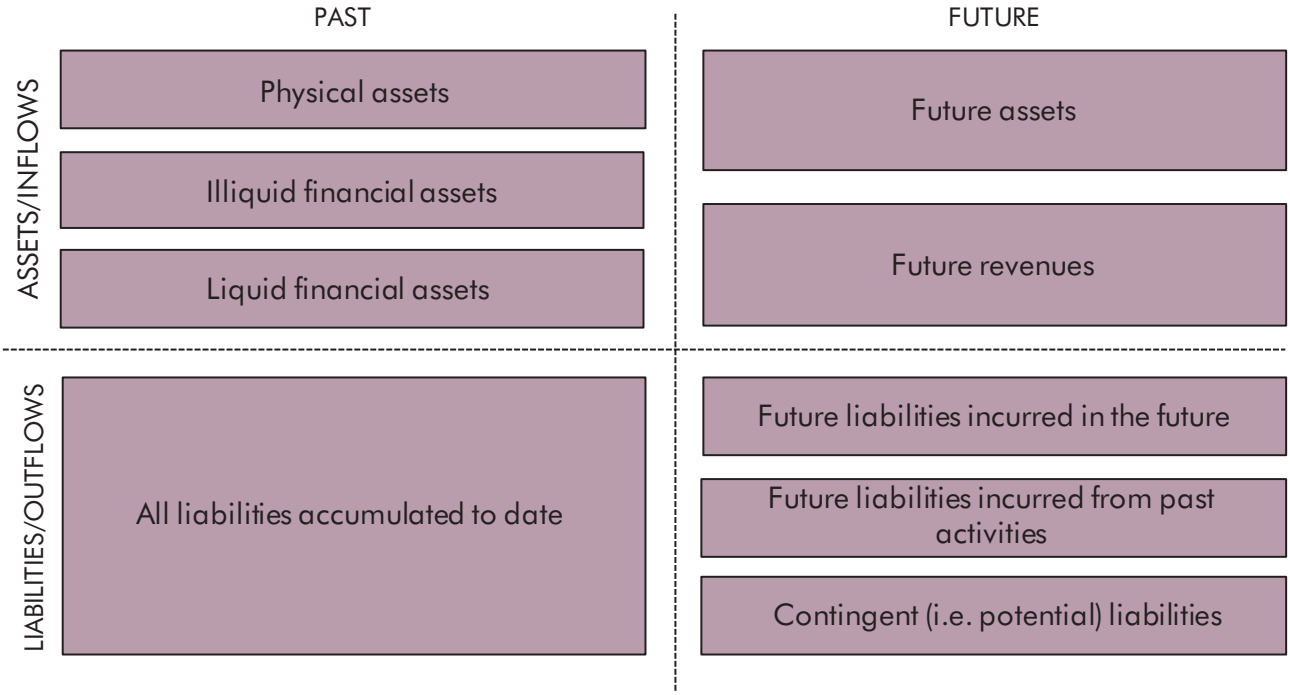
1.19 Figure 1.5 shows the coverage of our revenue and spending projections. They are more comprehensive than the backward-looking balance sheet measures, although there are still potential inflows and outflows that it is impossible to incorporate fully. These are lightly shaded in the diagram.

1.20 It is important to emphasise that, given the huge range of uncertainty around the issues and timescales covered in this report, the figures presented should be treated as illustrative projections, not precise forecasts. That is, they show how we would expect PSND to evolve if various assumptions about demographics and other factors were to hold; they are not our central expectation of what *will* happen. In this way, our long-term projections are qualitatively different from the medium-term forecasts we publish in our *EFOs*.

1.21 Our projections focus on the implications of future changes in the age structure of the population for particular broad categories of spending. We extend the analysis to take account of non-demographic drivers of spending and of long-term influences on different revenue streams. We also look at the impact of policy changes that can alter the size of these expected flows between *FSRs*.

1.22 On the revenue side, there are a number of non-demographic factors that might affect the size of particular revenue streams over the long term. These have been the subject of detailed analyses in previous *FSRs*. In Chapter 4 of this report, we refresh our analysis of long-term trends affecting UK oil and gas revenues.

Figure 1.5: Content of our revenue and spending projections



Summary indicators of sustainability

1.23 In Chapter 5, we discuss various approaches to summarising the implications of our long-term projections for fiscal sustainability. We consider definitions of fiscal sustainability that aim to be both rigorous and comprehensible.

1.24 Most definitions of fiscal sustainability are built on the concept of solvency – the ability of the government to meet its future obligations. A formal solvency condition can be given by the government's inter-temporal budget constraint (IBC). The IBC will be satisfied if the projected outflows of the government (determined by the current level of public debt and the discounted value of all future expenditure) are covered by the discounted value of all future government revenue. This means that over an infinite horizon the primary balance (government receipts less spending on items other than debt interest) must be sufficient to service and pay off the government's debt.

1.25 In some respects, the IBC is an unrealistic constraint to apply in practice. It is based on the premise that governments will eventually wish to eliminate their debts entirely, which relatively few have expressed a desire to do. And it permits a government to run large budget deficits for a significant period in the short and medium term as long as they hold out the promise of surpluses in the potentially far-distant future. For these reasons, we place greater emphasis on fiscal gap indicators that measure the immediate and permanent adjustment in the primary balance needed to bring the debt-to-GDP ratio to a particular level at a particular future date. We also look at more gradual ways to fill the same gaps.

Assumptions regarding Government policy

1.26 The goal of this report is to identify whether government policies are likely to be sustainable in the long term or whether there is likely to be a need to spend less and/or tax more in order to make them sustainable. To reach such a judgement, we first need to set out the assumptions we use regarding long-term policy.

1.27 Over the five-year horizon of our *EFOs,* the government's tax and spending policies are usually publicly announced and reasonably well defined. But assuming that governments would maintain the same policies over decades is sometimes unrealistic and would paint a misleading picture of fiscal sustainability. In the absence of a well-defined long-term policy, we have to make an appropriate assumption about what 'unchanged policy' would look like. The *Charter for Budget Responsibility* requires that "*where a long-term policy has not yet been set by the Government, the OBR will set out the assumptions it makes in its projections regarding policy transparently*". Given the importance of these assumptions, we aim to be fully transparent about them and our reasons for choosing them. The key policy assumptions are set out in Chapter 3.

1.28 In making long-term spending and revenue projections, we also need to decide how to deal with policies that are currently being considered by the Government but where no final, detailed announcement has yet been made. We use the same principle as in our medium-term forecast, consistent with the *Charter,* that we should include policies in our projections where final details have been announced that allow the fiscal impact to be quantified with "*reasonable accuracy*". We note significant policy commitments and aspirations not included in the central projections as fiscal risks, and where possible set out the potential impacts of such policies. This includes announced policies that are likely to give rise to contingent liabilities or guarantees in WGA in the future.

Structure of the report

1.29 We use the analytical framework set out above to structure the report as follows:

- Chapter 2: analyses the fiscal consequences of past government activity through alternative measures of the public sector balance sheet;
- Chapter 3: analyses the fiscal consequences of future government activity through long-term projections of revenue and expenditure;
- Chapter 4: focuses on North Sea oil and gas revenues; and
- Chapter 5: considers summary indicators of fiscal sustainability.

2 The fiscal impact of past government activity: the public sector balance sheet

2.1 This chapter looks at the fiscal impact of *past* government activity, as reflected in the assets and liabilities on the public sector's balance sheet. We look at two presentations of the balance sheet: the National Accounts and the Whole of Government Accounts (WGA).[1]

Balance sheet measures in the National Accounts

2.2 In this section we consider two balance sheet measures – public sector net debt (PSND) and public sector net worth (PSNW) – that are based on the National Accounts framework.

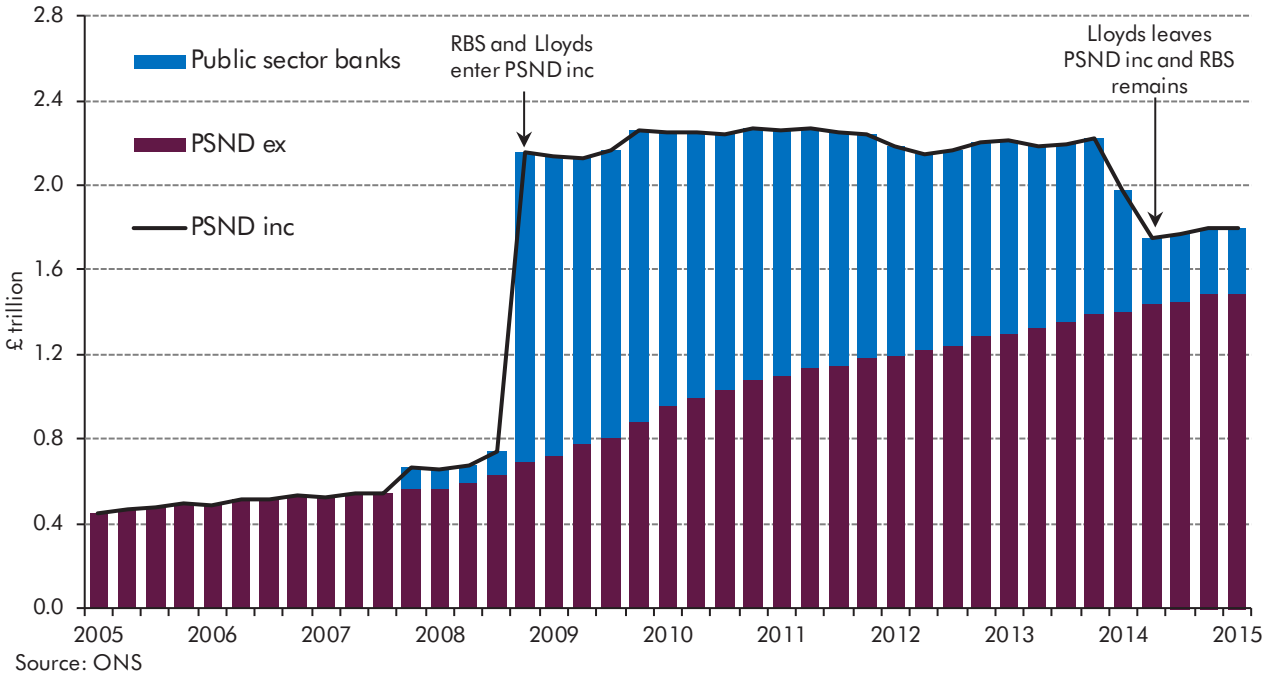
Public sector net debt and public sector net worth

2.3 PSND is defined as the public sector's consolidated gross debt, less its 'liquid' assets – that is, those that could readily be sold.[2] The last two Governments both set targets for PSND. The measure of PSND that both Governments targeted was 'PSND ex', which is now defined as PSND excluding the banks that are classified as part of the public sector.

2.4 In effect, PSND ex includes the cost to government of purchasing equity stakes in the public sector banks, but not the liabilities that are associated with funding those banks' assets (e.g. mortgages and other loans). The 'PSND inc' measure includes the full effect of the public sector banks' balance sheets (liabilities less liquid assets) on PSND. As Chart 2.1 shows, the difference between the two measures peaked at almost £1.5 trillion in late 2008, when RBS and Lloyds Banking Group were classified as public sector banks after the Labour Government took large equity stakes in both. Since then, as the public sector banks have reduced their assets – and the associated funding liabilities – their effect on PSND inc has diminished. Now that Lloyds has been reclassified to the private sector after the Government reduced its stake in the bank, PSND inc has fallen substantially further. It is now a much smaller £0.3 trillion higher than PSND ex. While this direct effect of the late 2000s financial crisis on PSND inc is now much smaller, the indirect effect on PSND ex via the associated recession and persistent reduction in underlying productivity growth remains large.

[1] HM Treasury (2015). We included detailed discussion of the information available in the WGA in our 2011 *FSR*. This year we give brief explanations of the main aggregates and concepts, but readers can refer back to the 2011 publication for further details.
[2] More details of how PSND is measured are available in O'Donoghue (2009).

Chart 2.1: PSND including and excluding the public sector banks



Source: ONS

2.5 The level of PSND changes each year by approximately the amount of public sector net borrowing (PSNB – the gap between spending and receipts), plus changes in public sector financial transactions (such as student loans and other government lending), less changes in liquid assets. PSND also includes an estimate of the additional debt that the government would have had to issue if it had purchased the buildings and other assets that the public sector uses through Private Finance Initiative (PFI) deals, but only for those assets that are classified as 'on balance sheet' in the National Accounts. The measurement of PFI deals within the various balance sheet measures is discussed later in the chapter.

2.6 The ONS made significant changes to PSND ex in 2014, to implement the conclusions of the review of the Public Sector Finances (PSF) statistics, and to make the PSF data consistent with the new 2010 European System of Accounts (ESA10).[3] These changes have been incorporated in our medium-term forecasts since our December 2014 *Economic and fiscal outlook (EFO)* and are therefore reflected in the measure of PSND ex that we are using in this *FSR*. The main changes relative to the measure used in last year's *FSR* include:

- bringing the Bank of England Asset Purchase Facility Fund (BEAPFF) inside PSND ex. This raises net debt because the nominal value of the gilts held by the APF is less than their purchase price. This effect will fall to zero when the APF is eventually unwound;

- treating Lloyds and RBS share purchases and compensation to depositors as illiquid rather than liquid assets. This raises net debt, as only liquid assets are subtracted from gross debt to arrive at net debt. Beyond the Lloyds share sales already announced and factored into our latest medium-term forecast, we do not assume any future share

[3] ONS (2014a).

sales or payments relating to the compensation schemes in our forecast, due to uncertainty over scale and timing, so this additional amount is assumed to persist; and

- reclassifying Network Rail into central government means that its net liabilities are now included on the public sector balance sheet, increasing PSND ex.

2.7 The overall effect of these methodological changes is to raise the level of PSND ex (hereafter simply 'PSND') by £129 billion in 2013-14. Other things being equal, this would have raised the debt-to-GDP ratio by 7.3 per cent. But other ESA10-related changes have raised nominal GDP, partly offsetting the effect of higher cash PSND and leaving the debt to GDP ratio 4.6 per cent higher in 2013-14. Table 2.1 provides a comparison of our PSND forecasts between the March 2014 and March 2015 *EFO*s. The effect from ESA10 changes is partly offset over the forecast period by the assumed effect of the Debt Management Office selling gilts above their nominal value (particularly index-linked gilts) and from the announced sales of Lloyds Banking Group shares and Northern Rock Asset Management assets.

Table 2.1: Changes in PSND between March 2014 *EFO* to March 2015 *EFO*

	Per cent of GDP[1]					
	Outturn		Forecast			
	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
PSND in March 2014 *EFO* (ESA95)	74.5	77.3	78.7	78.3	76.5	74.2
PSND in March 2015 *EFO* (ESA10)	79.1	80.4	80.2	79.8	77.8	74.8
Change	**4.6**	**3.1**	**1.5**	**1.5**	**1.3**	**0.6**
of which:						
Change in nominal GDP[1]	-3.5	-3.6	-3.4	-2.7	-2.4	-2.6
Change in cash level of net debt	8.1	6.7	4.9	4.2	3.6	3.2
	£ billion					
Change in cash level of net debt	144	124	94	83	75	69
of which:						
ESA10 and PSF review	129	133	135	137	135	134
Other changes in net borrowing	-2	2	9	7	3	2
Lloyd Banking Group share sales	0	-1	-10	-10	-10	-10
Gilt premia	1	-8	-22	-31	-36	-39
Other changes to net debt	16	-1	-17	-19	-17	-18

[1] Non-seasonally adjusted GDP centred end-March. Outturn and forecast consistent with our March EFO forecast.

2.8 The 1997-2010 Labour Government's 'sustainable investment rule' required it to keep PSND below 40 per cent of GDP over the economic cycle. But the financial crisis and recession pushed PSND well above that level. At the end of 2014-15, PSND stood at £1,484 billion, equivalent to 80.4 per cent of GDP or £55,600 per household.[4] The 2010-2015 Coalition Government initially set a supplementary target to have PSND falling as a share of GDP at a fixed date of 2015-16; the target date was then shifted to 2016-17 after Autumn Statement 2014. The forecasts shown in Chart 2.2 are from our March 2015 *EFO*.

[4] Based on 26.7 million UK households in 2014, from ONS (2015).

Thanks to significant planned asset sales during the current fiscal year 2015-16, PSND was forecast to fall by 0.2 per cent of GDP this year, so that the Government was not only on track to meet its new supplementary target, but also the one that it had dropped three months previously.

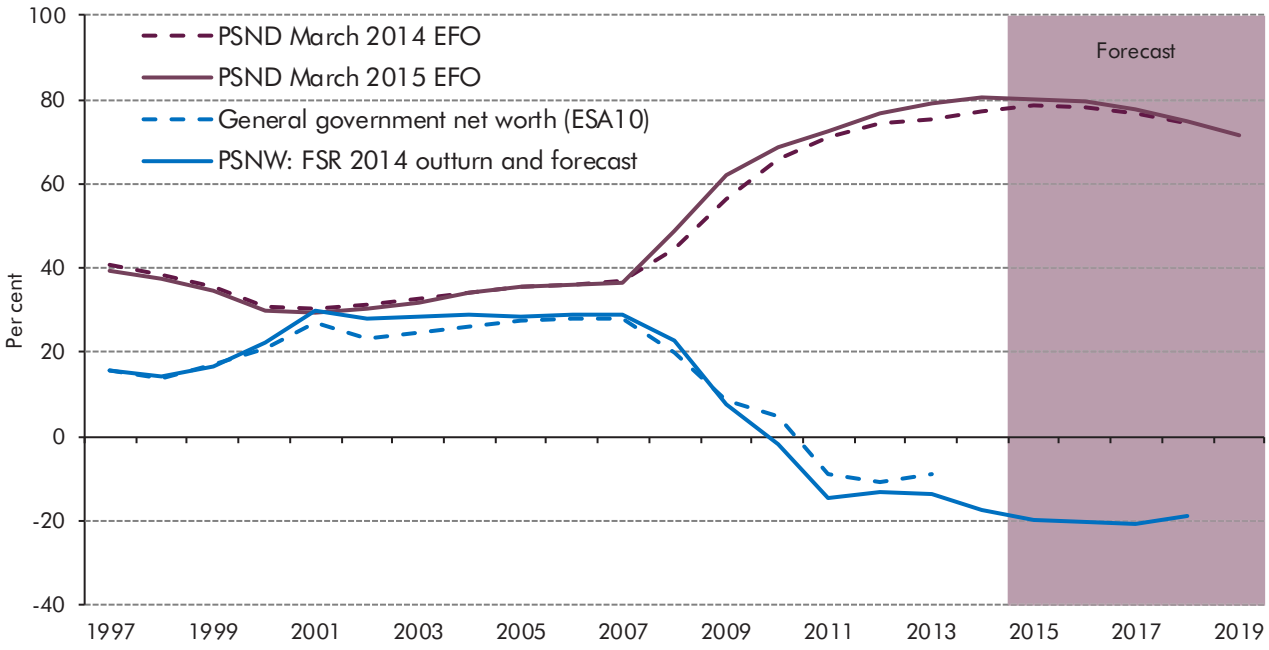
2.9 Public sector net worth (PSNW) is a wider balance sheet measure, comprising the public sector's financial liabilities net of all assets.[5] These include financial assets, such as shares and other equities, long-term loans, medium and long-term bonds, and non-financial assets, such as the road network. The ONS has currently suspended its publication of PSNW because it has taken on new capital stocks data, but needs to undertake further quality assurance before being able to split the data to distinguish between public and private corporations. For this report, we have therefore considered general government net worth (GGNW), a narrower measure that excludes public corporations.

2.10 Estimates of net worth have also been affected by ESA10 methodological changes. In particular, the capitalisation of research and development expenditure and the treatment of single use military equipment as capital have raised general government non-financial assets. The ONS has also incorporated Bradford and Bingley / Northern Rock Asset Management into its net worth estimates. The inclusion of these mortgage books raises the level of general government (illiquid) financial assets.

2.11 Chart 2.2 shows the recent levels of PSND and PSNW/GGNW. It shows how movements in net debt and net worth tend to mirror each other. This is because the value of the government's non-financial assets – the main difference between the two measures – tends to follow a relatively stable trend over time as it comprises large stocks of assets that depreciate slowly and are added to each year via government investment. Net worth has deteriorated since 2007 because most of the additional borrowing since then has been used to fund current rather than capital spending. On our latest forecast, it is only in 2017-18 that the government will run a surplus on the current budget. For the period 2009-10 to 2016-17, the public sector is expected to borrow £822 billion, with only £277 billion of this financing investment and the remaining £545 billion financing current budget deficits.

[5] PSNW is derived from National Accounts estimates of general government and public corporations assets and liabilities, which are published in the Blue Book. The composition of PSNW is set out in Hobbs (2010).

Chart 2.2: Recent levels and forecasts of PSND and PSNW/GGNW



Source: OBR

2.12 Net debt is only expected to start falling as a share of GDP from 2015-16 onwards, but GGNW showed a rise from -10.8 per cent of GDP in 2012 to -9.0 per cent in 2013. This mainly reflects the difference in how financial liabilities are measured. In net debt they are measured at nominal (redemption) value, whereas in net worth they are measured at market value. This means that movements in bond prices change net worth. In 2013, bond yields increased (from 1.8 to 3.0 per cent for a 10-year gilt), and consequently bond prices fell. As a result, financial liabilities rose by £101 billion as measured for net debt in 2013, but fell by £5 billion as measured for net worth. GGNW improved by 1.8 per cent of GDP – becoming less negative – while net debt deteriorated by 2.7 per cent of GDP. Bond yields fell in 2014, so net worth is likely to have deteriorated again last year.

2.13 Given that the market and nominal bond values will converge at the point of redemption, and that the Government will need to refinance its financial liabilities on redemption, in normal circumstances it should care more about the nominal values. In this respect, PSND is a more relevant measure of the public sector financial liability than PSNW.

New ONS information on government contingent liabilities

2.14 As we reported in last year's *FSR,* European Member States are now required to publish more data on government contingent liabilities.[6] (These are liabilities where the probability of them crystallising is non-negligible, but less than 50 per cent, as we discuss below from paragraph 2.78.) The ONS submitted these data to Eurostat at the end of 2014, publishing the new information alongside the December 2014 Public Sector Finances statistical bulletin.

[6] EU Council Directive 2011/85/EU (part of the enhanced EU economic governance package regulations known as the 'six pack') includes statistical requirements for government finance statistics relating to the annual publication of specific contingent liabilities and other potential liabilities.

2.15 The new ONS tables cover government guarantees, non-performing loans (impairments on student loans, and UKAR mortgages and loans on which payments are overdue by 3 months or more), PFI deals that are not on the National Accounts balance sheet, and government investment in public corporations. The information is taken from the published accounts of public sector organisations.

2.16 The ONS notes to the new tables explain that these results are experimental statistics and that they have the status of work in progress. The ONS plans to develop its methodology further and to publish updated tables covering 2014-15 in December 2015, as part of an article on wider measures of debt.

Balance sheet measures from WGA

2.17 The Whole of Government Accounts (WGA) are a set of financial statements for the whole of the public sector, produced by the Treasury under international commercial accounting standards, as adapted and interpreted for the public sector context. The Treasury has now published WGA for the five years from 2009-10 to 2013-14. The construction of the WGA was described in detail in our 2011 *FSR*, and in the Treasury's WGA publications.[7]

2.18 In this section, we will discuss the key results from the latest WGA for 2013-14, look at what has changed since last year's WGA and consider the main measurement differences between the WGA and the National Accounts.

2.19 The WGA paint a broader picture of the public sector balance sheet than the National Accounts, where coverage is entirely backward-looking (as shown in Figure 1.4 in Chapter 1). Some information on future liabilities is available in the WGA, for example on future public service pension payments and payments to PFI providers. WGA also reports provisions and contingent liabilities related to risks of future costs that could, but are not certain to, materialise as a result of past activities.

What's new in the 2013-14 WGA

2.20 Each year the basis of the WGA changes to reflect revisions to accounting policies and reclassifications that move bodies inside or outside the WGA public sector boundary. Where these changes are significant, the WGA balance sheet figures for the previous year are restated so that the two sets of results can be compared on a like-for-like accounting basis. Prior years are not, however, restated. And the net flows of revenue and expenditure are never restated, even for the previous year. As there have been significant revisions to accounting policies over the period, this means that the five years of WGA now available should not be thought of as a consistent time series.

2.21 In the 2013-14 WGA, the public sector boundary has been expanded to include UK Asset and Resolution Ltd (UKAR), the company that manages the assets of Bradford and Bingley and NRAM plc that were acquired by the Government during the late 2000s financial crisis.

[7] HM Treasury (2015).

The WGA results for 2012-13 have been restated to include UKAR, and the changes to the balance sheet are summarised in Table 2.2.

Table 2.2: Changes to main aggregates in restated 2012-13 accounts

	£ billion						
		Changes to include UKAR					
	2012-13 in 2012-13 WGA	Consolidate government liabilities and assets which have UKAR as counterparty	Add other UKAR assets and liabilities	Total	Other changes[1]	Total restatement	2012-13 restated in 2013-14 WGA
Balance sheet levels at end March 2013:							
Liabilities	-2,893		-36	-36	4	-32	-2,925
Assets	1,264	-47	84	36	-3	34	1,298
Net liabilities	**-1,630**	**-47**	**48**	**1**	**1**	**2**	**-1,628**

[1] Details of these other changes are contained in Note 38 of the 2013-14 WGA.

2.22 Table 2.2 shows that bringing UKAR into the WGA has two main effects:

- the WGA measure of **assets** is increased by £36 billion, as the government's £47 billion of assets in UKAR and UKAR's matching liabilities to the government are consolidated out, but UKAR's private sector assets – the largest of which is NRAM's mortgage book – are brought within the WGA boundary; and

- the WGA measure of **liabilities** is increased by £36 billion, reflecting UKAR's liabilities to the private sector that are brought within the WGA boundary.

These effects broadly offset each other, reducing total net liabilities by just under £1 billion.

2.23 The results for 2012-13 have also been restated for various other small changes. These reduce the net liability by just over £1 billion, giving a total reduction of around £2 billion.

2.24 The WGA boundary will be widened further in 2014-15, to include Network Rail. The National Accounts now include both UKAR and Network Rail within the public sector, and the WGA aims to use the National Accounts definition of the public sector boundary.

2.25 Table 2.3 shows the latest aggregate results from the 2013-14 WGA, and how these compare with the (partially restated) results for 2012-13. Total net liabilities are estimated to be £1,852 billion at end-March 2014, an increase of £224 billion on the previous year. This is mainly the result of a £264 billion increase in gross liabilities. These changes are discussed below.

2.26 The stocks of assets and liabilities in 2013-14 have been estimated using the latest WGA assumptions about market prices, discount rates and other estimates. The previous year's results are not restated for the changes in these assumptions. This makes it difficult to

compare the balance sheet levels between each year's WGA results, particularly where the net present value of future liabilities is revised due to changes in discount rates. The latest WGA results for the flows of income and expenditure are also based on the latest accounting policies, definitions and classifications – these flows are never restated in any respect.

Table 2.3: Changes in the WGA public sector summary aggregates

	£ billion		
	2012-13 Restated	2013-14	Difference
Balance sheet levels at end of year:			
Liabilities	-2,925	-3,189	-264
Assets	1,298	1,337	40
Net liabilities	**-1,628**	**-1,852**	**-224**
Flows during financial year:			
Revenue	-621	-649	-28
Direct expenditure	666	664	-2
Impairments and other costs from revaluations	51	54	3
Net financing cost and other gains and losses[1]	82	79	-3
Net expenditure[2]	**179**	**149**	**-30**

[1] Other gains and losses includes the revaluation of financial assets and liabilities and net loss on disposal of assets.

[2] In the WGA accounts for 2009-10 and 2010-11, this aggregate was termed the 'net deficit'. It is the deficit between items recorded as spending, less income.

2.27 Table 2.3 shows that the WGA measure of the net deficit – described as 'net expenditure' in the accounts – was £149 billion in 2013-14, a reduction of £30 billion relative to 2012-13. This is a bigger fall than the reduction in the National Accounts current budget deficit over the same period. These differences are explored further in subsequent sections.

2.28 In the WGA, some of the changes in balance sheet valuations are brought across into the revenue and expenditure account, so that the revaluations affect the WGA measure of the net deficit. Table 2.3 separates out the main effects of the impairments and revaluation costs within the net deficit. The remaining expenditure is termed 'direct expenditure'.

Changes in WGA gross liabilities

2.29 Total WGA gross liabilities increased by £264 billion in 2013-14, reaching £3,189 billion at end-March 2014. Table 2.4 shows that the rise was mainly the result of:

- a £130 billion rise in the estimated net public service pension liability. This mainly reflects revisions in the discount rate and other assumptions used to calculate the net present value of the future pension payments. These changes are discussed later in the chapter;

- a £100 billion increase in government borrowing and financing. This comprises net issuance of £82 billion of debt by central government, combined with an £18 billion reduction in the value of gilts held within the public sector by the Bank of England

Asset Purchase Facility Fund (BEAPFF). The BEAPFF holds assets (mainly gilts[8]) purchased from the market by the Bank as part of its past quantitative easing (QE) of monetary policy. The Bank did not change the overall level of QE in 2013-14, so this change simply reflects the change in the market value;

- an increase of £22 billion in deposits by banks and other financial institutions in the Bank of England; and

- an increase of £11 billion in provisions, mainly relating to nuclear decommissioning and clinical negligence. We discuss provisions later in this chapter.

2.30 The WGA balance sheet now includes UKAR's liabilities – mainly debt securities issued by Bradford and Bingley and NRAM. As these entities' assets are run down, the liabilities that funded them have been reduced each year.

Table 2.4: Changes in WGA gross liabilities

	£ billion		
	2012-13 Restated	2013-14	Difference
Balance sheet levels at end March			
Net public service pension liability	1,172	1,302	130
Government borrowing and financing[1]	996	1,096	100
Deposits by banks and other financial institutions in the Bank of England[2]	297	319	22
Provisions	131	142	11
PFI liabilities (capital commitments)	37	38	1
Trade and other payable obligations[3]	117	121	4
UKAR debt securities	30	26	-4
Other financial liabilities[4]	145	146	1
Total liabilities	2,925	3,189	264

[1] This borrowing includes additional Treasury bills advanced to banks as repos by the Bank of England under the Funding for Lending Scheme. But since the FLS is an asset swap scheme, and the T bills were advanced as repos (reverse repurchase agreements where securities were held as collateral and returned when the funds were repaid) this borrowing was offset elsewhere on the balance sheet.

[2] Includes the reserves created by the Bank to finance the BEAPFF's purchase of gilts.

[3] Includes refunds of taxation and duties, accruals and deferred income, obligations under finance leases and hire purchase contracts, and trade and other payables.

[4] Includes banknotes in circulation, the IMF Special Drawing Rights allocation, deposits by financial institutions under repo arrangements with the Debt Management Office and the Exchange Equalisation Account, borrowings by other entities across central and local government, financial guarantees, and foreign currency bonds issued by the Bank of England.

Changes in WGA gross assets

2.31 Total assets on the WGA balance sheet increased by £40 billion during 2013-14, to £1,337 billion at end-March 2014. Table 2.5 shows that this reflected the net effect of various increases and decreases in assets, of which one of the largest was an £18 billion increase in the financial assets held by the Debt Management Office (DMO) and the Exchange

[8] See Box 2.1 of our 2013 *FSR* for a full explanation of how quantitative easing and APF transactions are treated in the WGA.

Equalisation Account (EEA).[9] Large movements in DMO and EEA financial assets and liabilities are not unusual, given their daily money market and foreign exchange operations.

Table 2.5: Changes in WGA gross assets

	£ billion		
	2012-13 restated	2013-14	Difference
Balance sheet levels at end March			
Tangible and intangible fixed assets[1]	757	769	12
Equity investment in the public sector banks[2]	40	43	3
Student loans	36	39	3
PFI assets	37	39	2
Working capital (creditors)	139	149	11
UKAR mortgage loans	68	61	-6
Local government deposits with financial institutions	16	16	1
Loans and advances as part of HM Treasury's financial interventions[3]	6	6	0
Other loans and deposits[4]	46	64	18
Other financial assets[5]	105	104	0
Other assets[6]	49	47	-2
Total assets	**1,298**	**1,337**	**40**

[1] Net of depreciation and impairment of assets. Excluding assets financed by PFI, which are shown separately.

[2] Includes the value of the government's investments in the Royal Bank of Scotland and Lloyds Banking Group.

[3] Includes payments made by the Financial Services Compensation Scheme to pay depositors in failed financial institutions (which are recoverable or repaid from the FSCS levy payers), plus a bilateral loan to Ireland.

[4] Includes funds advanced to bank and central clearing counterparties under repo arrangements, as part of the operations of the Exchange Equalisation Account (EEA) and Debt Management Office.

[5] Includes EEA holdings of foreign government debt securities, the UK's quota subscription to the IMF, IMF special drawing rights, equity investments in the European Investment Bank, other inverstments in international financial institutions and the Bank of England's holdings of foreign government securities, currencies and equity investments.

[6] Includes holdings of gold, cash and cash equivalents, inventories and assets for sale.

2.32 As in previous years, the increase in fixed assets in 2013-14 partly reflects the 2013-14 WGA bringing some additional Academy schools inside the WGA public sector boundary. This increased fixed assets by £1.9 billion in 2012-13 and £0.9 billion in 2013-14.

2.33 Equity investments in the public sector banks in the WGA reflect the market value of the Government's holdings in Royal Bank of Scotland (RBS) and Lloyds Banking Group. (The Government's equity holdings in UKAR are now consolidated out.) At the end of 2013-14, these investments were valued at £43.0 billion, up £3.0 billion from the end of 2012-13. This increase reflected the net effect of the Government's sale of two tranches of Lloyds shares, which had been valued at £4.8 billion at end-March 2013,[10] more than offset by a £7.8 billion increase in the value of the remaining shares. (The Lloyds share sales together raised £7.4 billion in cash and generated an accounting gain of £4.1 billion compared with the book value at end-March 2013. This reduced the WGA net deficit in 2013-14.)

[9] During 2011-12 and 2012-13, the Debt Management Office held large asset and liability balances as part of its operations to manage the historically large government borrowing requirement. The Exchange Equalisation Account holds assets and liabilities as part of its operations to manage the government's foreign currency reserves.

[10] The first tranche of shares was sold in September 2013 and the second in March 2014.

2.34 During 2012-13, the Government also sold 70 per cent of its shareholdings in Royal Mail, raising £2 billion of cash and resulting in a profit on sale of £0.3 billion. Royal Mail has previously generated significant revenue in the WGA from the sale of goods and services (i.e. postal revenue). Prior to its sale in October 2014, it generated £4.5 billion in 2013-14, down from £9.9 billion in 2012-13.

2.35 The treatment of changes in asset values is one difference between the WGA and the National Accounts. In the WGA, net liabilities change each year to reflect the latest market values, and the change in value is included in the net deficit. In PSND, changes in market prices are not included until assets are sold and a profit or loss is realised.

2.36 Table 2.5 also shows that the 2013-14 WGA recorded £6 billion of loans to banks and other financial service entities outstanding at the end of 2013-14 from the Treasury's financial interventions. With UKAR now included within the WGA, these loans are confined to the bilateral loans to Ireland and the assets associated with the Financial Services Compensation Scheme (FSCS).

2.37 The changes in assets in 2013-14 from student loans and PFI deals are discussed later in the chapter.

Differences between WGA and National Accounts aggregates

2.38 When we looked at the differences between the WGA and the National Accounts in last year's *FSR*, the results differed because the two sets of accounts used different definitions of the public sector. Since then, both sets of accounts have expanded their coverage to include UKAR and the BEAPFF. The National Accounts boundary has expanded further to include Network Rail, which is not yet included within the WGA. The WGA aims to use the National Accounts definition of the public sector boundary, and the Treasury has announced its intention to include Network Rail in the 2014-15 WGA.

2.39 Over the past year, the ONS has also moved the National Accounts onto the basis of definitions used in the 2010 European System of Accounts (ESA10), and has implemented the recommendations from the review of the Public Sector Finances statistical bulletin. In some cases, this has aligned the way in which transactions are treated in the two sets of accounts more closely. For instance, under ESA10 'single use military spending' (SUME) is now treated as capital rather than current spending in the National Accounts, matching its treatment in the WGA. But other changes have widened the differences between the accounts. For instance, the government's shares in public sector banks are no longer classified as liquid assets, which are netted off net debt in the National Accounts. Since all assets are included in WGA assets, this has increased the gap between net debt and the WGA net liability. (It has, however, increased the consistency with which liquid assets are treated in net debt, since other shareholdings have always been treated as illiquid.)

2.40 Tables 2.6 and 2.7 show the reconciliation set out in the 2013-14 WGA results between the WGA and National Accounts aggregates on the latest definitions. These tables start with the fiscal aggregates from the National Accounts, and then adjust for various differences.

2.41 Table 2.6 shows that the differences between the WGA and the National Accounts measures of net debt are mainly due to two particularly large and partially offsetting items:

- the treatment of liabilities arising from **public service pensions**. PSND only includes liabilities arising from past cash payouts. The WGA debt measure includes an estimate of the net present value of future cash payouts arising from past employment. The 2013-14 WGA estimate of these additional liabilities is £1,302 billion (up from £1,172 billion in 2012-13). The large increase in the pension liability recorded in the 2013-14 WGA means that the WGA measure of net liability increased significantly more than PSND during 2013-14; and

- the inclusion of the public sector **tangible and intangible fixed assets** that are not included in PSND offsets a large part of these additional liabilities.

2.42 The WGA measure of net liabilities also includes future liabilities incurred to date for provisions, and amounts owed to creditors and owing from debtors. The other main items where net liabilities are measured differently in WGA and the National Accounts include the capital liabilities from more PFI deals, explored in more detail later in the chapter. There are also differences in how gilts are valued. The WGA revalue the net gilt liability each year to reflect the latest market prices, whereas PSND includes the nominal value of gilts issued. This difference also applies to the gilts held by the Asset Purchase Facility.

Table 2.6: Reconciliation of public sector net debt

	£ billion		
	Balance sheet levels at end March		
	2012-13 Restated	2013-14	Difference
Public sector net debt (National Accounts)	**1,299**	**1,402**	**103**
Remove items included in National Accounts but not in WGA:			
Network Rail	-34	-34	-1
Add net liabilities included in WGA but not in PSND:			
Net public service pensions liability	1,172	1,302	130
Provisions	131	142	11
Working capital (creditors and debtors)	-40	-45	-5
Add assets netted off in WGA net liabilities but not in PSND:			
Tangible and intangible fixed assets	-794	-808	-14
UKAR's non-liquid and other assets	-83	-74	9
Equity (including equity in public sector banks)	-65	-67	-2
Adjust for items measured differently:			
Capital liabilities for PFI contracts	32	33	1
Gilts held by the Asset Purchase Facility	-44	-45	-1
Gilts issued	31	29	-2
Other	24	17	-7
WGA net liabilities	1,628	1,852	224

2.43 Table 2.7 shows that the differences between the National Accounts current budget deficit and the WGA net deficit are mainly due to:

- the inclusion in the WGA net deficit of **net financing costs associated with the public sector pension liability.** This is an imputed flow, representing the net interest costs of a future liability where the spending has not happened yet;
- the WGA net deficit includes additional impairments (**write-downs of assets**);
- the classification of **capital grants** and spending on **research and development**, which count as capital expenditure in the National Accounts but as current expenditure in WGA; and
- the inclusion of **provisions** in the WGA (as liabilities for the present value of future spending where the spending obligation was incurred as a result of past activity), as distinct from a liability for spending to date as in the National Accounts.

2.44 Depreciation is measured on a different basis too.[11] Depreciation used to be higher in the WGA than in the National Accounts, but ESA10 changes that classify spending on SUME and research and development as capital spending have increased National Accounts depreciation associated with those capital assets. The measure of depreciation is now higher in the National Accounts than in the WGA.

2.45 As mentioned above, the profits from the sales of Lloyds shares in 2013-14 reduced the WGA net deficit. However, profits or losses from sales of shares are not included in the National Accounts accruals measures of the current deficit or net borrowing. They only affect the cash measures of the net cash requirement and PSND.

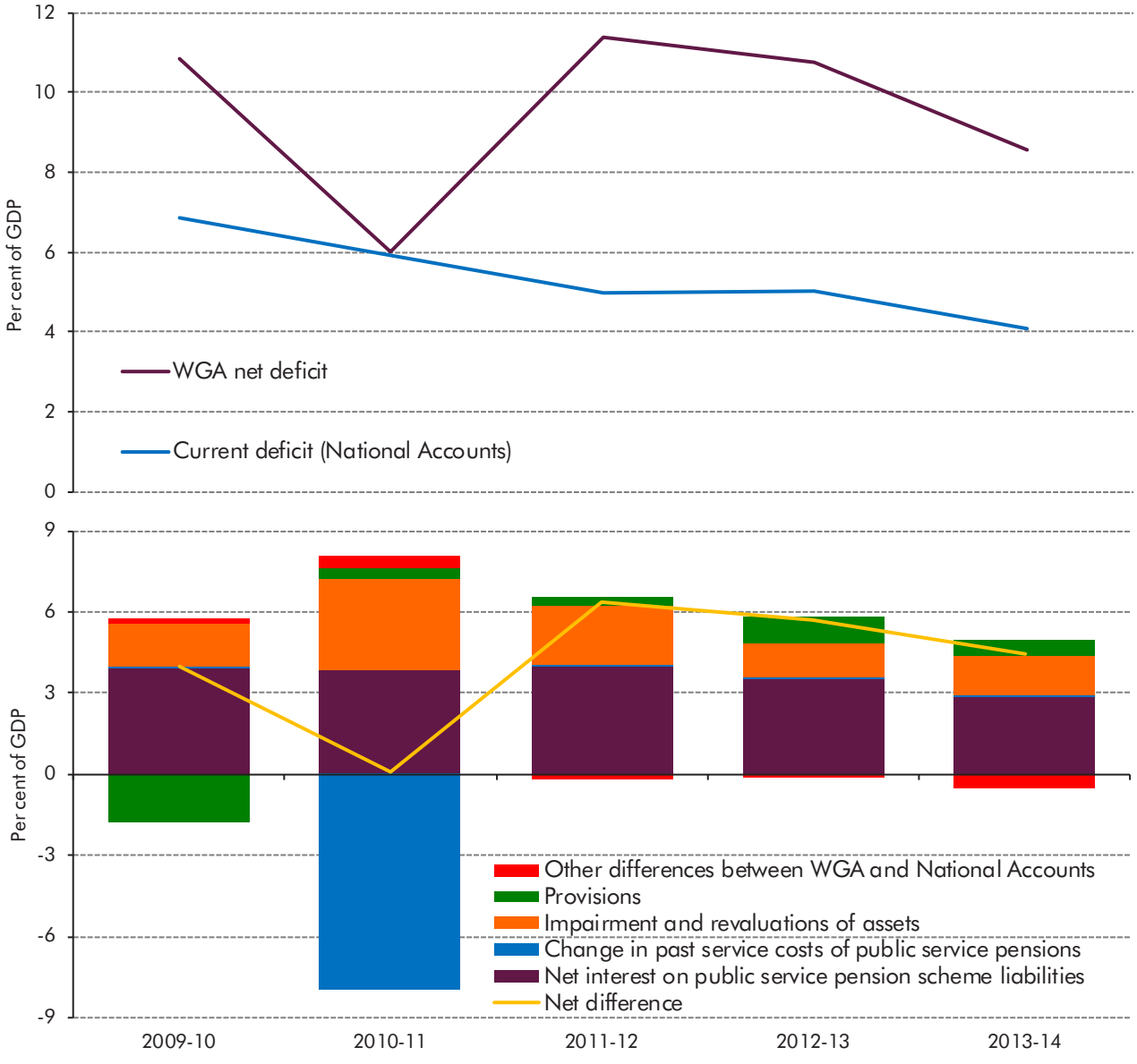
Table 2.7: Reconciliation of public sector current deficit

	£ billion		
	2012-13	2013-14	Difference
Current deficit (National Accounts)	**83**	**71**	**-12**
Plus additional items included in WGA net deficit:			
Net financing costs on public service pension schemes	48	49	1
Impairment and revaluations of assets	21	26	5
Capital grants	12	11	-1
Net changes in provisions	16	10	-6
Net gains/losses on sale of assets	3	-4	-8
Research and development	0	3	3
Adjust for items measured differently			
Depreciation	-5	-8	-3
Other	-1	-9	-8
Net deficit for the year (WGA)	**179**	**149**	**-29**

[11] As explained in the section on depreciation and impairment on page 40-41 of the 2011 *FSR*.

2.46 WGA are now available for five years. They are subject to discontinuities that mean that, unlike the National Accounts, the WGA data are not designed to be comparable across multiple years. This is illustrated in Chart 2.3, which compares the WGA net deficit with the National Accounts current deficit. The biggest difference was in 2010-11, when the WGA net deficit was reduced by 8.0 per cent of GDP due to the revaluation of public sector pension liabilities that followed the Government's switch from RPI to CPI inflation uprating. This reduced the expected value of future payments. Looking across the five years, the WGA net deficit was 2.3 per cent of GDP lower in 2013-14 than in 2009-10. The National Accounts current deficit fell by 2.8 per cent of GDP over that period. Provisions are the main explanation for the different trends: they reduced the WGA net deficit by 1.8 per cent of GDP in 2009-10 (when a £25 billion provision related to the Asset Protection Scheme was reversed), but increased it by 0.6 per cent of GDP in 2013-14.

Chart 2.3: Differences between WGA and National Accounts net current deficit



Source: HM Treasury

Additional information on future liabilities

2.47 The following sections review 2013-14 WGA information on future liabilities incurred from past activities. Before taking each set of liabilities in turn, we look at student loans. These are assets rather than liabilities, but some loans will be written off over time and the WGA contains useful information on expected levels of future write-offs.

2.48 We also look at recent policy announcements affecting future contingent liabilities and guarantees. These are not currently included in our forecasts for PSNB and PSND, because they are future risks that could materialise, but are not currently expected to. But it is useful to keep track of these announcements to ensure that we consider any risks to our assessment of fiscal sustainability from these potential liabilities crystallising.

Student loans

2.49 Government loans to students appear as assets in the WGA, while the borrowing to finance them adds to liabilities. Student loans incur a cost to the public finances when the interest payments are subsidised (i.e. when the interest paid by students on the loans does not cover the government's borrowing costs) or when loans cannot be repaid and are written off. So the issuing of student loans tends to increase net liabilities.

2.50 Expected student loan write-offs are included in the WGA as balance sheet impairments when each loan is issued, where the impairment covers the total estimated cost of write-offs over the life of each loan. In the National Accounts, the interest subsidies and write-offs are not charged to the deficit and net debt until they arise. As with pensions and provisions, the differences between the two frameworks reflect timing: WGA includes the expected future spending when the liability for that spending is first incurred; the National Accounts include the spending when the spending happens. The National Audit Office (NAO) highlighted the uncertainty associated with modelling and estimating future write-offs in its commentary on the BIS accounts, due to the number and volatility of the assumptions underpinning those estimates.

2.51 Table 2.8 shows that the WGA estimate of student loan assets increased by £3.0 billion in 2013-14, to £38.9 billion at the end of the year. New loans issued through the course of the year, and expected future interest income, increased the gross value of the assets by £10.3 billion. Actual repayments of existing loans reduced assets by £1.9 billion.

2.52 Changes to impairments on new and existing loans were £5.4 billion. This includes:

- impairments for future costs of new loans issued, in respect of lower subsidised interest payments and write-offs – where some of the loans issued are expected not to be recovered because of death, disability, income or age of the student;

- changes in the estimate of total impairments for future costs of previous loans issued. These impairment costs are re-estimated in each year's accounts to reflect the latest OBR long-term economic projections; and

- both elements were affected by an update to the BIS student loan repayment model, which was described in the BIS 2013-14 Annual Report and Accounts[12] and Annex B to our 2014 *FSR*.

Table 2.8: Changes to student loan assets

	£ billion			
	2010-11 restated	2011-12 restated	2012-13 restated	2013-14
Student loan assets at 1 April	27.6	29.6	33.1	36.0
Student loan assets at 31 March	29.6	33.1	36.0	38.9
of which:				
England (BIS)	25.0	28.1	30.7	33.4
Scotland	1.9	2.0	2.0	2.3
Wales	1.5	1.7	1.9	1.8
N Ireland	1.2	1.4	1.3	1.5
Total change in value of student loan assets during the year	**2.0**	**3.6**	**2.9**	**3.0**
of which:				
New loans issued and interest on total stock of assets	8.1	8.8	9.1	10.3
Repayments on existing loans	-1.5	-1.5	-1.9	-1.9
Amortisation and impairments on new and existing loans	-4.6	-3.8	-4.2	-5.4

2.53 The WGA figures, which reflect the underlying numbers in the BIS and devolved administrations' 2013-14 accounts, reflect the long-term projections in our 2013 *FSR*, so they do not reflect our latest economic projections. The WGA figures also do not include the impact of loans that the Government would expect to make to future students. We take these factors into account in Chapter 3 when considering the impact of student loans on our long-term fiscal projections. In Annex B to our 2014 *FSR*, we considered the sensitivity of these projections to different assumptions.

Net liabilities of public service pensions

2.54 The WGA balance sheet includes an estimate of the current net liability for the future payment of pensions for all public service pension schemes, where the liability to pay the pension was incurred as a result of past employment. It does not cover liabilities associated with future employment, so the 2013-14 balance sheet only reflects costs associated with public service employment up to March 2014.

2.55 The latest WGA results show that net public service pension liabilities increased by £130 billion in 2013-14, from £1,172 billion (69 per cent of GDP) at the beginning of the year to £1,302 billion (73 per cent of GDP) at the end of the year. This covers the liabilities of both unfunded and funded schemes.

[12] Department for Business, Innovation and Skills (2014) – see Note 14 on 'Other financial assets'.

2.56 Table 2.9 shows the main factors that contributed to the change in the net pension liability over the five years from 2009-10 to 2013-14. It is helpful to consider these in two broad groups. First, there are those factors that routinely increase the liability each year:

- the additional future pension costs accruing from staff employed each year, which are partly offset by reductions in the existing liability for pensions paid out each year for the unfunded schemes and by employee contributions for the funded schemes.[13] These costs fluctuate from year to year, partly reflecting changes in the number of staff employed, but also changes in discount rates.[14] This means that the reduction in the discount rate used in this year's WGA will increase the future pension costs that will be included in next year's WGA in respect of staff employed in 2014-15; and

- the interest costs that are added to the pensions liability each year, for the notional cost of financing the net pensions liability accrued to date. This is partly offset by the interest earned on the funded pension schemes' assets.

2.57 Second, there are other factors that can raise or lower the net pension liability in any given year. In 2013-14, two of these other factors increased the net liability:

- the real discount rate (used to convert the expected future pension payments into a one-off upfront sum) was reduced by 0.6 percentage points, increasing the net pension liability. The precise effect of the discount rate change was not split out in the 2013-14 WGA. Instead it was included in a £23 billion increase arising from 'Changes in assumptions underlying the value of future liabilities', which also included changes related to other assumptions such as mortality rates and salary increases; and

- corrections to previous assumptions, where the latest outturns or assumptions differ from the assumptions used for previous accounts, increased the net pension liability by £61 billion. These are similar assumptions to those used to value the future liabilities above (e.g. mortality rates and salary increases), but these adjustments reflect the extent to which events over the most recent accounting year differed from the actuarial assumptions made previously. The WGA records that these assumptions are inherently uncertain, and corrections can lead to significant changes, as shown in Table 2.9.

2.58 Given the importance of discount rate movements to balance sheet measures that are estimated as net present values of future flows, it would be helpful for fiscal transparency if the Treasury could explain the changes in assumptions that are covered by both of these factors in next year's WGA.

2.59 Policy changes that affect future pension costs can also prompt large changes in the net pension liabilities reported in the WGA. For example, the 2010-11 accounts showed a £126

[13] Reductions in the pensions liability for the funded schemes from pensions paid out are offset by reductions in those schemes' assets. Employee contributions for the unfunded schemes are included in income recorded in the WGA statement of income and expenditure since those schemes by definition do not hold the contributions as assets.
[14] These adjustments are included because the estimates of future pension costs for the current year's employment are calculated each year based on the discount rate used at the beginning of the year, i.e. the discount rate from the previous year.

billion fall in the liability associated with the June 2010 policy decision to change the indexation of public service pensions from the RPI measure of inflation to the CPI measure, which is typically lower. Ongoing changes to future pension costs associated with the Hutton reforms[15] will affect estimates of net pension liabilities and employer contribution income in future WGA publications.

Table 2.9: Changes to net liabilities of public service pensions

	£ billion				
	2009-10 restated	2010-11 restated	2011-12 restated	2012-13 restated	2013-14
Net pension liability at 1 April[1]	802	1,135	961	1,006	1,172
Net pension liability at 31 March[1]	1,135	961	1,006	1,172	1,302
Change	333	-174	45	166	130
of which:					
Future pension costs for staff employed in current year[2]	28	40	35	35	41
Changes in assumptions underlying the value of future liabilities, including the change in the real discount rate	258	-69	10	57	23
Change in past service costs[3]	1	-126	1	0	-1
Transfers in/out[4]	-	0	2	27	2
Corrections to previous estimates of pension liabilities to reflect events and assumptions in latest accounting period	29	-31	-12	40	61
Pensions paid for the unfunded pension schemes[5]	-27	-29	-31	-35	-36
Other changes[6]	45	41	40	41	41

[1] Includes gross liabilities of funded and unfunded public service pension schemes, net of assets for the funded pension schemes.

[2] The movement in these costs each year reflects an adjustment to correct the previous year's costs for the previous year's change in discount rate. So these costs rise and fall in line with the change in liabilities from the change in discount rate, but with a 1 year lag.

[3] The -£126 billion fall in past service costs in 2010-11 was the reduction in future liabilities from the June 2010 policy decision to change the indexation for public service pensions from the RPI to the CPI, from April 2011.

[4] In 2012-13, this includes the transfers from the Royal Mail Pension Plan (RMPP), which was a funded pension scheme, to the new Royal Mail Statutory Pension Scheme, which is an unfunded pension scheme. Since the measure of net pension liabilities is only net of assets held by the funded pension schemes, this transfer increased net pension liabilities by the value of the RMPP assets (£28 billion).

[5] From 2012-13 onwards, this additionally includes pensions paid for the new Royal Mail Statutory Pension.

[6] Includes interest on pension schemes' liabilities less expected return on pension schemes' assets, less employee contributions for the funded pension schemes.

2.60 Table 2.10 shows the discount rates used by the central government unfunded pension schemes in their accounts between 2008-09 and 2014-15.[16] These can go up or down, reflecting movements in corporate bond yields, and the net pension liability will be reduced or increased accordingly. The table shows that a lower discount rate will be used in next year's accounts for 2014-15, which will raise the pension liability again.

[15] Independent Public Service Pensions Commission (2011).

[16] The discount rates are set in the Government Financial Reporting Manual (FReM), based on real yields of high quality corporate bonds. This follows the requirements of international accounting standards. The discount rates are expressed in real terms, using the price indexation used to uprate public service pensions. In June 2010, the Government changed the indexation used to uprate public service pensions from the RPI to the CPI, from April 2011.

Table 2.10: Discount rates for central government pension schemes

	Per cent						
	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Discount rate, nominal	6.0	4.6	5.6	4.9	4.1	4.4	3.6
Discount rate, real, using RPI	3.2	1.8	2.2	1.8	1.4	0.8	0.4
Discount rate, real, using CPI			2.9	2.8	2.4	1.8	1.3
Discount rate, real, as used to uprate public service pensions	**3.2**	**1.8**	**2.9**	**2.8**	**2.4**	**1.8**	**1.3**

The Private Finance Initiative

2.61 Most public sector capital investment involves the public sector funding and completing capital projects itself. Under the Private Finance Initiative (PFI), a private sector firm will create and/or maintain the asset at its own cost, which the public sector counterparty agrees to pay for over time.

2.62 Based on ESA10 guidelines, the capital costs of some PFI deals are recognised as liabilities on the National Accounts public sector balance sheet, but many are not. As well as lacking transparency, this generates a perception that PFI has been used as a way to hold down official estimates of public sector indebtedness for a given amount of overall capital spending, rather than to achieve value for money.

2.63 The ONS includes an asset and any associated liability on the National Accounts public sector balance sheet if it believes that the public sector bears most of the *financial risk*. In contrast, WGA puts the asset and associated liability for capital costs on the public sector if it is judged to have *effective control* of it.

2.64 As at March 2014, PSND included liabilities of £5.1 billion (0.3 per cent of GDP) in respect of the capital costs of PFI deals on balance sheet in the National Accounts. This estimate is based on previous liabilities. The ONS is working with the Treasury to improve the data on departments' PFI deals and intends to review the estimate of the associated PSND costs when the improved data become available.[17] The ONS has also announced that it intends to consider the classification of the commitments arising from the new Private Finance Two (PF2) contracts.[18]

2.65 Based on the classification approach used for the WGA, Table 2.11 shows the latest figures recorded on the WGA balance sheet for PFI assets and capital liabilities. It shows that the future liability estimated for capital amounts payable at end-March 2014 was £37.8 billion, up £1.2 billion from end-March 2013. This is a smaller increase than in earlier years. The liability will rise as new deals are signed, but will otherwise fall as capital repayments are made. The value of assets acquired through PFI projects was estimated at £38.6 billion at

[17] In December 2014 the ONS published for the first time some experimental statistics on off-balance sheet public private partnerships (PPP) showing the capital value of outstanding liabilities. But these data are designated 'experimental statistics' and as such may be subject to future revision as improvements are made to data collection arrangements. See the section on 'New ONS information on government contingent liabilities' above.
[18] The ONS announced in its June 2014 National Accounts classification forward workplan that it would review how the contractual arrangements in the new PF2 framework fit against the available guidance. ONS (2014c).

end-March 2014, up £1.6 billion from end-March 2013. Existing PFI assets are revalued and depreciated each year.

2.66 As well as this liability for future capital PFI payments, the WGA contain details of the present value of obligations for future PFI payments, which cover service and interest payments as well as capital costs. (The obligations for future capital payments are higher than the future liabilities recorded on the balance sheet because the obligations cover some associated costs that are likely to materialise, but which are not sufficiently certain to be included on the balance sheet.) The latest value of these future obligations is shown in Table 2.11, showing the breakdown between capital, interest and service charge payments. The latest results show that the present value of future interest payments and service charges was lower at the end of March 2014 than a year earlier. This reflected increases associated with new PFI contracts being more than offset by decreases as previous PFI contracts ended.

2.67 These associated interest and service costs would also have been incurred over future periods if the assets had been acquired through traditional capital purchases. However, the difference with assets purchased under PFI deals is that these costs become relatively firm long-term obligations, and they therefore have the potential to reduce the flexibility for other spending in the future.

2.68 The Treasury also publishes the results of a separate data collection exercise each year, which currently covers all PFI projects funded by central government. This shows which projects would be on or off the balance sheet using the International Financial Reporting Standards used in the WGA. The data are not audited and the results are not necessarily consistent with the figures in the latest WGA. The latest Treasury data published in December 2014 cover PFI deals signed up to end-March 2014.[19] These show that, if no further deals were signed, annual cash payments on these PFI projects (covering capital, interest and service costs) would peak at 0.5 per cent of GDP in 2017-18. In aggregate, these annual payments are a relatively small proportion of total spending. But such payments are not distributed evenly across the public sector and so the potential constraint may be more binding in some areas. These costs will be included in Departmental Expenditure Limits, and the budgets of individual NHS trusts, local authorities and public corporations.

2.69 These separate Treasury data suggest that future PFI liabilities recorded as on balance sheet in the WGA may relate to around 97 per cent of all PFI assets, by capital value. This suggests the total potential capital liability of on and off balance sheet PFI contracts could be slightly higher than reported, at £39 billion or 2.2 per cent of GDP. It implies that, if all capital spending under PFI were to have been carried out through conventional debt financing, PSND would have been 1.9 per cent of GDP higher at end-March 2014. This difference is little changed from last year.

[19] HM Treasury (2014 a,b,c).

Table 2.11: WGA PFI data

	£ billion				
	2009-10	2010-11	2011-12	2012-13	2013-14
WGA data for PFI deals on balance sheet:[1]					
Figures from the Statement of Financial Position (balance sheet):					
Net book value of PFI assets	30.9	34.9	38.7	37.0	38.6
Liability for future capital payments	28.1	32.0	36.1	36.6	37.8
Present value of obligations for future payments	**164.9**	**183.6**	**191.7**	**198.8**	**192.4**
of which:					
Capital payments[2]	34.1	35.1	38.0	39.3	40.3
Interest payments	33.4	39.0	42.3	42.2	41.8
Service charges	97.4	109.5	111.4	117.3	110.3
HM Treasury data for percentage of PFI deals on balance sheet (IFRS basis) (per cent)[3]	-	89	97	97	97
OBR calculations of WGA liability for future capital amounts payable, grossed up to total PFI deals, on and off balance sheet (per cent of GDP)	-	2.2	2.3	2.2	2.2

[1] On balance sheet on IFRS basis at end of financial year. Figures for 2009-10 to 2012-13 are as restated in following year's WGA.

[2] The obligations for future capital payments include additional costs such as contingent rents and lifecycle replacement costs.

[3] Calculations based on data that cover all PFI deals funded by central government. This includes many local government PFI projects, but it will exclude any local government or public corporations PFI schemes that are funded by their own sources of finance. The calculations also exclude any data that does not specify whether the PFI deal is on or off balance sheet.

2.70 The WGA also contain details of the time periods over which the future capital and interest obligations are expected to arise, and how these obligations are split by sector (Table 2.12).

Table 2.12: Future PFI payments, split by time period and sector

	£ billion			
	2010-11 restated	2011-12 restated	2012-13 restated	2013-14
WGA data for the present value of capital and interest and service charge obligations for future periods, for PFI deals on the WGA balance sheet [1,2]	183.6	191.7	198.8	192.4
of which, obligations arising:				
Within one year	9.0	9.3	10.5	10.3
Later than one year, but within next five years	34.1	36.1	37.4	37.2
Later than five years	140.6	146.2	150.8	145.0
and of which, obligations by sector:				
Central government (including NHS)	110.2	114.7	121.9	114.6
Local authorities	69.6	72.9	72.8	73.8
Public corporations	3.9	4.2	4.1	4.0

[1] The obligations for future capital payments include additional costs such as contingent rents and lifecycle replacement costs.

[2] In 2009-10 the total of the WGA data for these future obligations is £164.9 billion. However no breakdown is available for the future service charge obligations by time period, or sector.

Treasury control total for PFI spending

2.71 The Coalition Government announced in Autumn Statement 2012 that it would introduce a control total for the commitments arising from off balance sheet PF2 contracts. The Government subsequently announced further details of how the new control total would work. It would include all existing PFI and PF2 contracts funded by central government, whether on or off the WGA balance sheet. It would apply from 2015-16 onwards. The control would be a limit of £70 billion in nominal terms, which would apply over the five-year period from 2015-16 to 2019-20. This would cover all payments in respect of these PFI contracts, including payments to cover capital, interest and service costs. The Government said that performance against this control total would be assessed at each Budget.

2.72 The Treasury data published in December 2014 showed total cumulative spending from 2015-16 to 2019-20 for payments on all PFI contracts funded by central government of £51.9 billion. This covered PFI deals that will be subject to the control total that had been signed by end-March 2014. This update included nine additional projects that were signed during 2013-14, which increased total spending over the control total period by £0.5 billion. This update implies substantial headroom below the £70 billion control total, although that will also need to cover future deals signed over the remaining period up until the end of 2019-20.

2.73 The Treasury also publishes separate data on PFI projects currently in procurement, which are relevant to the £18 billion headroom against the control total. These currently show:

- 11 projects in procurement at end-March 2014, with an estimated capital value of £816 million;[20]
- two remaining batches of projects under the PF2 Priority Schools Building Programme. There were five batches of projects under this programme, which were due to deliver £700 million of private finance in total, and be signed by summer 2015. Three batches were signed in March 2015, with an estimated capital value of £405 million, and these are included in the 11 projects in procurement above. The two remaining projects are expected to be signed in June and August 2015; and
- the £350 million PF2 Midland Metropolitan Hospital, which is the next project in the pipeline, subject to business case approval.

Other financial commitments

2.74 WGA net liabilities include other finance leases that are not PFI-related. As with the bulk of the PFI deals, the capital commitments are included on the balance sheet in WGA, but off the balance sheet in the National Accounts. These non-PFI finance leases carried a further capital commitment of £5.0 billion at end-March 2014, little changed from a year earlier.

[20] This is the capital value for nine of the projects. The data were not supplied for the remaining two projects.

2.75 The WGA also include details of various other financial commitments that are not included on the WGA balance sheet. These financial commitments are expected to be incurred, but are not reported as future liabilities in the WGA until the associated capital asset or service is realised.

2.76 These further financial commitments include interest payments on finance leases, all payments on operating leases, and payments on capital and other contracts. The present values of future payments are shown in Table 2.13. The time span of these financial commitments varies, depending on the length of the lease or contracts, and these WGA figures show the present cost of the known current and immediate future commitments. As such, if contracts are extended, the costs recorded in the WGA will rise.

2.77 Table 2.13 shows two significant year-on-year changes in the 2013-14 WGA related to the present value of non-cancellable contracts:

- the present value of the payments expected to be paid to Network Rail and other train operating companies under the transfers set out in the Deed of Grant legislation and the rail franchise agreements has increased from £6 billion to almost £23 billion. This reflects new and extended franchises, as the programme for agreeing franchises rolls forward. This illustrates how extending contracts increases the present value of such commitments recorded in the WGA. As these extensions firm up commitments that might previously have been regarded as implicit, this is an example of where the balance sheet approach to examining fiscal sustainability is less useful than considering the flows of spending on public services; and

- the £7.2 billion remaining working capital facility that Bradford and Bingley and NRAM had not yet used, and which was included as a non-cancellable contract in the 2012-13 WGA, is no longer included in the 2013-14 WGA. This reflects the boundary change to bring Bradford and Bingley and NRAM into the WGA boundary this year. As the working capital facility is a commitment made by one public sector entity to another, it is consolidated out of the WGA reporting.

Table 2.13: Future payments for other financial commitments

	£ billion	
	2012-13	2013-14
On balance sheet in WGA - included in net liabilities		
Finance leases: capital payments	**5.3**	**5.0**
Off balance sheet in WGA - *not* included in net liabilities		
Finance leases: interest payments	**19.8**	**19.0**
Operating leases	**21.0**	**17.8**
Contracted capital commitments:	**37.7**	**34.6**
of which:		
MOD commitments for property, plant and equipment, and for intangible fixed assets	16.7	14.5
TfL contracts for transport and infrastructure projects	3.7	2.4
NHS and DH capital and IT contracts	2.6	2.3
Other capital contracts[1]	14.7	15.4
Other non-cancellable contracts:	**49.3**	**58.7**
of which:		
Payments to Network Rail and train operating companies[2]	6.0	22.9
Higher education grants	6.2	5.3
Undrawn working capital facility for Bradford & Bingley and NRAM[3]	7.2	-
NHS and DH IT services, purchase of vaccines and R&D	4.6	4.8
BBC outsourcing, programme acquisitions and rights	3.5	3.4
DEFRA facilities management costs, IT maintenance and local authority projects	2.3	2.5
Engineering and Physical Sciences Research Council grants	2.1	2.2
Other[1]	17.4	17.6

[1] Other contracts, of around £1 billion, or less.

[2] Payments by Department for Transport and Scottish Government.

[3] This contract is shown as nil for 2013-14 because Bradford & Bingley and NRAM are included within the 2013-14 WGA and the amounts therefore consolidate out.

Provisions and contingent liabilities

2.78 Provisions are recorded in the WGA when public sector bodies undertake activities that are expected to result in future costs. The provisions record the net present value of the future liabilities arising from past activities, and are estimated using the relevant discount rate.

2.79 New provisions increase the total of net liabilities recorded on the WGA balance sheet. They are then reduced when the actual spending occurs. All the expected future spending is charged to the WGA expenditure and income account (increasing the WGA net deficit) when the future liability is initially recognised and the new provision is made. In contrast, the liabilities only appear on the National Accounts public sector balance sheet when the spending occurs. Assuming the expected future cost materialises, this creates a timing difference between the two sets of accounts.

2.80 The notes to the WGA also record various contingent liabilities, where the chances of the costs arising are judged to be less than 50 per cent. So it is possible, but not probable, that

these future costs will occur. The contingent liabilities are classified as 'off balance sheet' and they are not included in the WGA main financial statements or the summary aggregates. They are sub-divided into quantifiable and unquantifiable contingent liabilities, with a separate category of 'remote' for those where the chances of the costs arising are judged to be near zero.

2.81 In principle, we would expect our forecasts to include the future fiscal costs of liabilities treated as provisions, depending on their timing. But we would not expect our forecasts to include the cost of contingent liabilities, as they have a less than 50/50 chance of crystallising, so they would not appear in a central forecast. However, contingent liabilities are still fiscal risks, and we therefore need to consider them (and the circumstances that could cause them to crystallise) when assessing fiscal sustainability.

2.82 Table 2.14 summarises the main provisions and quantifiable contingent liabilities recorded in the 2013-14 WGA.

Table 2.14: Provisions and quantifiable contingent liabilities in the WGA

	£ billion		
	2012-13 restated[1]	2013-14	Difference
Future liabilities covered by provisions (on balance sheet):			
Nuclear decommissioning	69.9	77.5	7.6
Clinical negligence	23.6	26.6	3.0
Taxes subject to legal challenge	4.2	5.4	1.2
Oil and gas field decommissioning	3.8	3.1	-0.7
Financial Assistance Scheme	3.9	4.2	0.3
Equitable Life payments scheme	0.9	0.6	-0.3
Department of Health (NHS)	3.6	3.8	0.2
DECC (reprocessing contracts and Coal Authority)	3.4	2.9	-0.5
Other provisions	17.7	17.7	0.0
Total provisions[1]	**131.0**	**141.8**	**10.8**
Future levels of quantifiable contingent liabilities (off balance sheet):			
Financial stability interventions	9.9	0.3	-9.6
Export guarantees and insurance policies	12.7	12.1	-0.6
Clinical negligence	10.5	11.9	1.4
Taxes subject to challenge	14.5	29.2	14.7
Supporting international organisations	32.1	0.5	-31.6
Other	8.2	9.0	0.8
Total quantifiable contingent liabilities	**87.9**	**63.0**	**-24.9**

[1] Provisions increased by about £5 billion in 2012-13, because of a reduction in the short and medium term discount rates used to calculate central government provisions, where those discount rates had not changed since 2005. These discount rates have been updated in the 2013-14 WGA but the updates did not have a material impact on the results.

2.83 Provisions increased by a net £11 billion in 2013-14, taking the present value of existing provisions to £142 billion at end-March 2014. The changes included an increase of £26 billion for re-estimated and new provisions, offset by a reduction of £10 billion for provisions that were used during the year. £6 billion of previous provisions were also

removed because they were no longer judged to be likely to crystallise. Use of provisions in 2013-14 was lower than predicted in last year's WGA, although the majority of the difference reflects a short-term provision in the Ministry of Justice's accounts being reclassified as no longer a provision.

2.84 This year saw further increases in the two largest provisions:

- the provision for **nuclear decommissioning** increased by £7.6 billion to £77.5 billion at end-March 2014. Most of this provision is accounted for by the Nuclear Decommissioning Authority (NDA). In particular, decommissioning Sellafield accounts for around 60 per cent of the overall provision and for £5.1 billion of the increase in 2013-14. The latest WGA reported that this increase for Sellafield was largely the result of revised estimates of future clean-up costs, partly as a result of extending timescales and partly because efficiencies assumed in previous plans would not be realised. It also warns that this provision is likely to increase significantly when the NDA completes scrutiny of its plan. The NAO has emphasised the particular uncertainty around these estimates. A further £1.8 billion increase in the provision relates to British Energy's decommissioning liabilities. Although British Energy is now owned by EDF Energy, the Government has underwritten its liabilities to the extent that the assets of the associated fund fall short. A review carried out by EDF increased the provision to £7.2 billion; and

- the estimate of the provision for **clinical negligence** increased by £2.9 billion to £26.4 billion at end-March 2014. The latest WGA reported an unprecedented number of new claims, with more than 1,000 claims per month received for six months of the year. It also reported that the increase in claims coincided with new legislation that reformed the funding arrangements for civil litigation, with an expectation that the new legislation might lower claimant lawyers' fees over time. As we noted in last year's *FSR,* the NHS Litigation Authority 2013-14 accounts show that legal costs accounted for about a third of total pay-outs.[21]

2.85 Table 2.14 shows that the levels of contingent liabilities recorded in the 2013-14 WGA fell by £25 billion. This reflects large reductions in two contingent liabilities, which more than offset the rise associated with taxes subject to legal challenge (discussed below):

- the contingent liability associated with **financial stability interventions** has fallen by £9.6 billion to just £0.3 billion. The majority of the fall was because the Government cancelled the £8 billion contingent capital facility that had been made available for RBS. The only remaining contingent liability that the Government continues to report as being related to financial stability interventions is a £0.3 billion time-limited tax indemnity provided to Virgin Money under the terms of the sale of Northern Rock plc. Of course, as the late 2000s financial crisis demonstrated, there will remain a significant, if unquantifiable, fiscal risk associated with the banking system; and

[21] See NHS Litigation Authority (2013), Figure 4 and page 21.

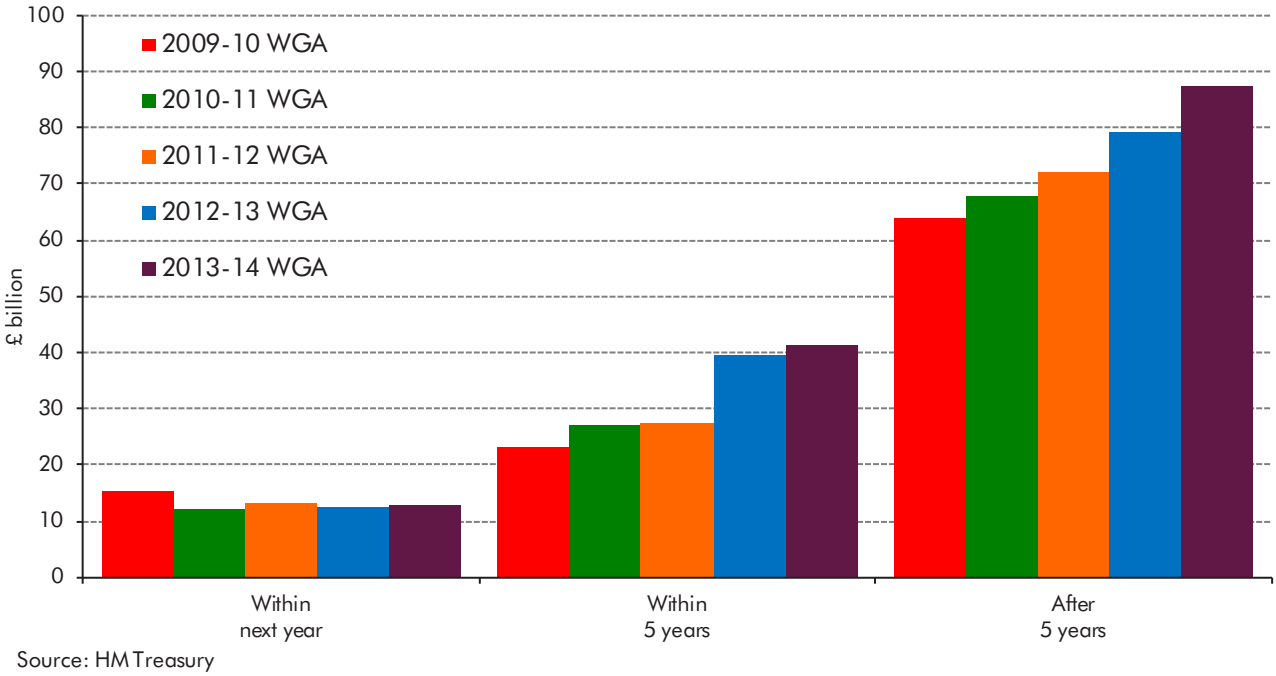
- the contingent liability associated with the UK's callable capital subscription to the **European Investment Bank (EIB)** (which makes long-term infrastructure loans to EU countries) has been reduced to zero from £30.2 billion in last year's accounts. The accountants consider that the likelihood of Member States being called upon to pay the remaining capital is now remote (reverting to the position in the 2010-11 WGA).

2.86 Table 2.15 presents 2013-14 WGA data on the time period over which the provisions are expected to be spent compared with the restated estimates from last year. Chart 2.4 shows how these estimates have evolved over the past five years. It is striking that while the year-ahead spending associated with provisions has been relatively stable in successive WGA publications, provisions over the coming five years increased sharply in the 2012-13 WGA and provisions over the longer term have been rising steadily. Nuclear decommissioning and clinical negligence provisions – the largest and fastest rising provisions – explain much of this trend. Both represent pressures on departmental budgets that our medium-term forecasts suggest will be subject to a significant squeeze over the coming years.

Table 2.15: Timing of use of WGA provisions

	£ billion				
		Provisions at end March			
		Future time period when provisions expected to be used			
	Provisions used in financial year	Within next year	Within 5 years	After 5 years	Total level of provisions
2012-13 restated	12.7	12.5	39.3	79.2	131.0
2013-14	9.7	13.0	41.3	87.5	141.8

Chart 2.4: WGA provisions by expected time period of use



Source: HM Treasury

2.87 HMRC includes both provisions and contingent liabilities in its accounts to cover risks from litigation where the tax at risk is over £100 million. The provisions cover cases where HMRC believes a settlement payment will be required. However, given the drawn out nature of this type of litigation, there remains a significant degree of uncertainty over when the settlement will be made. Contingent liabilities cover cases where HMRC believes it is possible, but less than 50 per cent likely, that a settlement payment will be required. Cases at an earlier stage of the litigation process might initially be included as a contingent liability before being reclassified as a provision at a later stage. Another distinction between the two categories might be the treatment of 'lead' cases and 'follower' cases. In a number of HMRC litigation cases a successful legal challenge from a lead plaintiff would also benefit a number of follower plaintiffs who are awaiting the outcome of the lead case. There is less information on these follower cases, so they are more likely to be included as contingent liabilities.

2.88 As we reported in last year's *FSR*, HMRC increased the provision to £5.4 billion in its 2013-14 Trust Statement and doubled the contingent liability to £29.2 billion. The main reason for the increased provision was a judgement in a high value lead case going against HMRC. This also led to the inclusion of a number of potential follower cases as contingent liabilities. In our *EFO* forecasts, we assess the latest information available from HMRC on all the court cases and risks, and include our central assumption of the amount that might be paid out over the forecast period. In our March 2014 *EFO,* we included an assumption that expected tax losses from litigation would amount to £3.6 billion over the period 2014-15 to 2018-19; in our March 2015 *EFO* that assumption was increased to £5.4 billion over the period 2015-16 to 2019-20.

Non-quantifiable contingent liabilities

2.89 Table 2.16 lists the main significant non-quantifiable contingent liabilities. These are judged unquantifiable either because the estimates of possible costs are too uncertain, or because quantification would jeopardise the outcome of a case. The WGA information summarised below shows the main non-quantifiable contingent liabilities listed in departments' accounts. The expansion of the WGA boundary to include UKAR has meant that the previous non-quantifiable contingent liabilities in relation to Bradford and Bingley and NRAM have now been consolidated out, and these are not included in the latest table.

Table 2.16: Non-quantifiable contingent liabilities in the 2013-14 WGA

Details of the most significant non-quantifiable contingent liabilities in the 2013-14 WGA
• Legal claims, compensation claims and tribunal cases against various WGA entities.
• Commitments made by several WGA entities to fund any deficits of individual pension schemes.
• HM Treasury guarantees for indemnities in relation to financial stability interventions (now just covers the compensation scheme set up in 2009 in relation to the Dunfermline Building Society).
• HM Treasury's contingent liability for risks associated with reinsurance arising from acts of terrorism.
• Various civil nuclear contingent liabilities in BIS resource accounts.
• Future increases in liabilities of the Financial Assistance Scheme beyond those recognised in the provision.
• Contingent liability in relation to the Channel Tunnel (to return the land to a suitable condition if the tunnel ceases to operate).
• Access to life insurance for Ministry of Defence personnel.

Remote contingent liabilities

2.90 The WGA also include details of remote contingent liabilities, which are those where the chances of the liability actually arising are close to zero. These remote contingent liabilities are similarly divided into quantifiable and unquantifiable.

2.91 The 2013-14 WGA show that the quantifiable remote contingent liabilities increased by £31.3 billion during the year, and stood at £104.9 billion at end-March 2014. The increase mainly reflected the reclassification of the £29.5 billion contingent liability for the EIB, which was reclassified in the 2013-14 accounts from a quantifiable contingent liability to a remote quantifiable contingent liability. This was explained in paragraph 2.85.

New contingent liabilities and guarantees from recent policy announcements

2.92 This section brings together the Government's main recent policy announcements that are expected to generate additional contingent liabilities and guarantees. The National Accounts fiscal aggregates that we forecast do not include these, because the probability of them materialising is thought to be less than 50 per cent. We would expect them to be included in the WGA when they begin to generate a potential future liability, with the liability expected to appear as some sort of contingent liability, off the balance sheet. We keep track of these announcements to ensure that we cover any risks from these potential liabilities materialising and adding to PSNB and PSND in the future.

2.93 Table 2.17 shows the main Government schemes that have been announced recently, but which have not yet materialised as significant future liabilities in the WGA. The schemes covered are unchanged from last year's report. They have been updated for the extent of the future liabilities that have been committed for each scheme, and the extent to which they have been reflected in government accounts to date. The largest single scheme is the UK Guarantees Scheme, which provides guarantees for private financing of UK infrastructure. Other schemes in this area include the Green Investment Bank (GIB) and the Pensions Infrastructure Platform.[22] As we did for last year's *FSR,* we have sought and received assurances from the Treasury that there are no guarantees or contingent liabilities related to the other funding avenues listed in the National Infrastructure Programme that are significant in the context of Table 2.17.

2.94 In addition to the schemes shown in the table, there have been two policy announcements that we noted in our December 2014 and March 2015 *EFOs* as policies that could give rise to additional future liabilities. These were:

- the extension of the Enterprise Finance Guarantee scheme (noted in December). We have not included this in Table 2.17 because the maximum contingent liability associated with the one-year extension of this scheme would be less than £0.1 billion; and

[22] HM Treasury (2014b)

- the Help to Buy ISA (noted in March), where the policy provides for a bonus of up to £3,000 for first-time buyers opening an ISA to save for a deposit. When operational, the scheme would generate contingent liabilities when individuals open savings accounts and become eligible for future payments that are contingent on the individual using those savings as a house deposit. We included an estimate of the cost of this policy on PSNB in our March 2015 forecast, which increased to £0.8 billion by 2019-20. The costing was judged to be 'very high' in the uncertainty ratings we apply. We have not included a future liability for this new scheme in Table 2.17 as the WGA treatment of its mixture of actual payments and potential liabilities for future actual payments is unclear.

2.95 While the precise accounting treatment of some of the future liabilities discussed here may not be known until future years' WGA are published, it is useful to monitor the broad implications for fiscal sustainability. Most importantly, while the probabilities of each of the contingent liabilities happening on their own could well be considered as remote, the probabilities of the liabilities crystallising would most likely be positively correlated. In particular, the probability that the various parties to which the Government is exposed will default would increase in the event of a further economic downturn, particularly if it was focused on the housing and financial sectors. The more serious the downturn, the greater the likelihood of a larger proportion of contingent liabilities crystallising to the detriment of fiscal sustainability.

Table 2.17: Schemes with future liabilities announced after March 2013

Scheme	Limit (cap)	Date scheme announced	Period scheme operates	Extent scheme operating	In 2013-14 or 2014-15 accounts?	Resource accounts
Housing Guarantee Scheme[1]	£10 billion	September 2012	June 2013 to December 2016	At the end of March 2015, DCLG had approved borrowing of £1.25 billion, of which £0.7 billion has been drawn down and is covered by guarantee[1]	In 2014-15 accounts	DCLG
Help to Buy: mortgage guarantee	£12 billion	March Budget 2013	January 2014 to December 2016	Currently operating. Contingent liability to March 2015: £631 million	In 2013-14 and 2014-15 accounts	HMT
Help to Buy: equity loan	£9.7 billion	March 2013	April 2013 to March 2020	Currently operating. Loans issued to March 2015: £1,993 million	In 2014-15 accounts	DCLG
Export Refinancing Facility	£5 billion[2]	July 2012	Permanent	Open for business, but no loans issued yet	Nothing included until UKEF makes a loan	UKEF
Business Bank Wholesale Guarantees	£1.25 billion[3]	The £1.25 billion was announced at Autumn Statement 2012 and Autumn Statement 2013	2014 onwards	The first guarantee was committed in 2014-15. This will support £125 million of lending, which had been committed to, but not yet issued at the end of March 2015	Mentioned in the 2014-15 accounts, but no contingent liability until any loan is issued	BIS
UK Guarantees Scheme	£40 billion of contingent liabilities	July 2012	October 2012 to December 2016	7 guarantees signed so far, covering £1.7 billion in total: - Drax Power - Sustainable Development Capital - Northern Line Extension - Mersey Gateway Bridge - Ineous Grangemouth - Speyside biomass power station - University of Northampton 36 projects currently prequalified with capital value of over £40 billion[4]	Guarantees signed so far are included in 2013-14 and 2014-15 accounts as contingent liabilities	HMT

[1] This scheme includes Private Rented Sector and Affordable Housing guarantees. The information on the extent that the scheme is operating relates to Affordable Housing guarantees. Private Rented Sector guarantees have not been utilised yet and no guarantees are expected to be issued until 2016.

[2] This cap for UKEF's Export Refinancing Facility is separate from the £50 billion upper limit on UKEF's provisions and capital liabilities for its guarantees and insurance policies.

[3] This is one of a number of new programmes which the Business Bank is proposing to fund from its £1.25 billion capital injection from the Government, however it is the only new scheme issuing guarantees resulting in contingent liabilities.

[4] Since projects are generally financed through a mixture of debt and equity, the capital value of prequalified projects should not be taken to predict the potential contingent liabilities from the UK Guarantees Scheme.

Conclusion

2.96 In this chapter we have reviewed the latest information available from the two main measures of the public sector balance sheet. We have seen that:

- substantial revisions to the National Accounts have increased the ratio of PSND to GDP relative to the estimates we used in last year's report. PSND increased by 1.3 per cent of GDP in 2014-15, reaching 80.4 per cent of GDP at end-March 2015. Thanks to significant government asset sales, our latest forecast shows PSND falling as a share of GDP in 2015-16;

- the WGA measure of net debt increased by £224 billion in 2013-14 to £1,852 billion. The increase was largely explained by two factors – additional borrowing to finance the net deficit in the year, because expenditure exceeded revenues, and an increase in the estimated liability associated with public sector pensions; and

- once again, the WGA show a significant increase in estimates of provisions (up by £11 billion to £142 billion) due to higher expected costs of future nuclear decommissioning and clinical negligence settlements. These provisions will represent substantial pressures on departmental budgets, which our medium-term forecasts already suggest will be subject to a significant squeeze in the coming years.

2.97 One theme in this chapter has been that the direct effects of the late-2000s financial crisis on the public sector balance sheet are now declining:

- the PSND inc measure of debt – which includes all net debt of the public sector banks, not just the government borrowing that financed purchase of equity in those banks – is now £0.3 trillion above the headline PSNB ex measure, down from a peak of almost £1.5 trillion at the end of 2008. That reflects the public sector banks shrinking their assets, but also Lloyds Banking Group being reclassified to the private sector as the Government has reduced its equity stake;

- the WGA contingent liabilities that the Government classifies as associated with financial sector interventions have fallen to £0.3 billion from £9.9 billion a year earlier, as the £8 billion contingent capital facility available to RBS was withdrawn. While these contingent liabilities have fallen to almost zero, there will remain a significant, if unquantifiable, fiscal risk related to the financial system (as is the case for all governments); and

- our medium-term forecast shows PSND ex falling in 2015-16 thanks to the sale of £20 billion of assets that the Government holds as a result of interventions made during the financial crisis – notably mortgage assets held by NRAM and much of its remaining stake in Lloyds. As these sales exchange one form of asset (e.g. mortgages or shares) for another (e.g. cash), they could have little or no effect on WGA net liabilities. That contrasts with the effect on PSND, where the assets being sold are not netted off net

debt because they are illiquid, but the proceeds of the sale would either increase liquid assets if held as cash or reduce gross liabilities if used to pay down debt.

2.98 While these direct effects on the public sector balance sheet are now diminishing rapidly, the indirect effect via the recession that accompanied the financial crisis and, more importantly, the large and persistent hit to the economy's potential to produce national income continues. Our latest medium-term forecast is consistent with the hit to potential output relative to the pre-crisis expectation being 11 per cent by 2013-14 rising to 14 per cent by 2019-20, helping to explain why the structural fiscal deficit remained at 4.2 per cent of GDP (£76 billion) in 2014-15, despite five years of fiscal consolidation.

2.99 The measures of the public sector balance sheet reviewed in this chapter provide a useful snapshot of the fiscal impact of past government activity. But they are of limited use in assessing fiscal sustainability: neither measure includes the expected impact of future government activity, notably future spending and future tax raising. We turn to this in Chapter 3.

3 The fiscal impact of future government activity: long-term fiscal projections

3.1 Chapter 2 examined the fiscal impact of *past* government activity, including some future cash flows, as reflected in measures of the public sector balance sheet. To assess long-term sustainability, we also need to estimate the potential fiscal impact of *future* government activity. In this chapter, we do this by making long-term projections for public spending, revenues and financial transactions, and then assessing their implications for the potential path of public sector net debt.

3.2 Long-term projections of this type allow a relatively comprehensive assessment of fiscal sustainability. They take into account items such as the future cost of public service pensions, but without the same sensitivity to the choice of discount rate as the balance sheet approach. They also recognise that the government has many non-contractual – but nonetheless meaningful – ongoing spending commitments. For example, it is likely to wish to continue to provide state education and health care. Crucially, it recognises that the government has the ability to levy taxes in the future.

3.3 Given the significant uncertainty inherent over the extended time horizons that we consider here, our results should be treated as illustrative projections, not detailed forecasts. The first five years of the projections are consistent with the medium-term forecasts to 2019-20 that we published in the March 2015 *Economic and fiscal outlook* (*EFO*), so as to focus on longer-term influences rather than fresh revisions to our medium-term assessment.

3.4 This chapter first outlines the policy, demographic and economic assumptions required to generate our projections, pointing out where these have changed since last year's *Fiscal sustainability report (FSR)*. We then explain how we make our central projections of spending and revenue, and then present our results, noting significant changes since last year. This is followed by sensitivity analysis, focusing on the medium-term starting point, interest rates, demographic influences and health spending.

Key assumptions

Policy assumptions in the long-term projections

3.5 The projections in this report assume unchanged government policy. But Chapter 1 explained that it is often far from straightforward to define unchanged policy over a 50-year horizon. Table 3.1 sets out the major policy assumptions we make.

Table 3.1: Policy assumptions in the long-term projections

Policy	Long-term assumptions in the central projections
Taxes	Direct and indirect taxes uprated in line with earnings from 2020-21. All tax escalators to end by 2019-20.
Departmental spending	Spending by function is consistent with the latest spending review plans out to 2015-16. Implied real spending cuts in the four years to 2019-20 are distributed evenly across departments. Grown in line with nominal GDP from 2020-21 onwards, apart from items subject to demographic influences.
Pensioner benefits	State Pension age (SPA) equalised at 65 by November 2018, before reaching 66 by October 2020 and 67 between 2026 and 2028. Subsequent SPA changes are based on changes in life expectancy. Qualifying ages for other state pensions spending, such as pension credit, and pensioner-related benefits, such as the attendance allowance, rise in line with SPA. Single-tier pension introduced for new pensioners from April 2016. Basic state pension and single-tier pension uprated using the 'triple lock' mechanism. Additional pension uprated in line with CPI.
Other benefits (e.g. working age benefits)	All working age benefits uprated with earnings from 2020-21. Universal credit is rolled out to the timetable assumed in our March 2015 forecast.
Student loans	Policy parameters (e.g. cap on tuition fees and repayment threshold) uprated in line with earnings from 2020-21. The pre-2012 loan book is sold, with the sale of the first tranche taking place in 2015-16. The cap on student numbers is removed by 2015-16. No changes to real interest rate applied to fees and maintenance loans (i.e. 3 per cent during study and between 0 to 3 per cent after graduation, depending on earnings).
Public service pensions	Incorporates previous policy reforms: to increase employee contributions; uprate payments with CPI; and amend scheme benefits in line with the Public Service Pensions Act 2013, including linking pension age to the SPA.

3.6 Since last year's report, the Coalition Government has made a number of policy announcements relevant to our long-term projections, including:

- setting out medium-term tax and spending policies to 2019-20 in Autumn Statement 2014 and in Budget 2015;
- confirming its intention to sell the pre-2012 student loan book from 2015-16; and
- announcing significant asset sales, including part of the mortgage assets of NRAM plc and its shareholding in Lloyds Banking Group.

The projected longer-term impacts of these policies are discussed in more detail below. The new Conservative Government has announced that another Budget will be delivered on 8 July. Consistent with the remit set for us by Parliament, we will not reflect the implications of any new policies until we publish our next long-term projections.

State Pension age

3.7 The Government has legislated for a review of the State Pension age (SPA) to take place at least once every six years; in effect once in each Parliament. This review would be based on a technical assessment by the Government Actuary and an additional report considering other relevant factors. Details of the core principle to guide that review were set out alongside Autumn Statement 2013: that people should expect to spend on average a third of their adult life (beginning from age 20) in receipt of the state pension, with at least ten years' notice provided and changes being phased in over two years.[1]

3.8 Table 3.2 sets out our projections of what this core principle would imply if life expectancy evolved in line with the ONS's latest principal (central), old age or young age population projections. This is unchanged from last year's report, with the central projection implying that the increase in the SPA to 68 currently legislated to take place between 2044 and 2046 would be brought forward to the mid-2030s, to be followed by further increases to 69 in the late-2040s and to 70 in the early-2060s. Under the young age variant projection, lower life expectancy would imply no further increases in the SPA beyond 67 over the next 50 years. By contrast, under the old age variant the third-of-life principle would imply a succession of additional increases in the SPA from the 2030s onward, reaching 75 by the end of our projection period. In this variant, life expectancy for a 75-year old in 2065 is projected to have reached 100, while the population would contain 1.3 million people aged 100 and over, an increase from around 16,000 this year.

Table 3.2: Projected changes to the State Pension age over the next 50 years

State Pension age	Year within which the rise is fully implemented			
		Population variant		
	Legislated	Young age	Central	Old age
66	2020	2020	2020	2020
67	2028	2028	2028	2028
68	2046		2036	2031
69			2049	2034
70			2063	2037
71				2040
72				2045
73				2051
74				2057
75				2064

Expenditure on public services

3.9 For public services such as health and education, we assume an underlying real increase in expenditure per capita in line with average earnings and whole economy productivity growth of 2.2 per cent a year from 2020-21 onwards. This implies that – absent changes in

[1] For further detail on the Government's announcement, see Department for Work and Pensions (2013).

the demographic profile – spending remains flat as a share of actual GDP. By locking in that position, we take no account of any potential cyclical swings in output in later years, which may be expected to result in spending temporarily rising or falling as a share of GDP (see Box 3.2).

3.10 The starting point for demographically driven spending is an important assumption for our long-term projections. The Government has not set out detailed spending plans beyond the current year, with total spending from 2016-17 onwards determined by an aggregate spending assumption. That assumption implies an amount that could be spent by departments, but not how that amount would be allocated across departments. We base our projections on the functional split of spending in 2015-16, consistent with the detailed departmental plans set for that year. In our central projection, we assume that the spending cuts implied between 2015-16 and 2019-20 are distributed evenly across all departmental spending. We test the sensitivity of our projections to this assumption later in the chapter.

3.11 From our 2019-20 starting point, we apply our demographic projections to capture the effect of changes in the population structure on expenditure. We do not make an explicit assumption about the level of service this implies, which will depend on factors such as public sector productivity and the demand for public services.

Tax and benefit uprating

3.12 In our medium-term forecasts, unless the Government states otherwise, we assume that it will uprate income tax allowances and thresholds in line with inflation. But because earnings are expected to rise more quickly than prices in the long term (due to productivity growth), this definition of unchanged policy would result in the average tax rate rising steadily over time as more income moves into higher tax bands. This is known as 'fiscal drag'. It would not be realistic to assume that this would be allowed to continue indefinitely. Indeed, estimates of the long-run relationship between tax revenues and GDP suggest that in practice other factors have, on average, offset fiscal drag.[2] As in previous reports, we therefore assume that allowances and thresholds rise in line with earnings rather than prices beyond the medium-term horizon, turning off fiscal drag after five years.

3.13 A similar issue arises on the spending side – uprating working-age benefits with prices rather than average earnings over the long term would see the value of those benefits shrinking steadily relative to the living standards of the bulk of the population. As in previous reports, we therefore assume that working-age benefits rise in line with earnings in the long term.

3.14 Box 3.2 of our 2014 *FSR* quantified the effects of fiscal drag on revenues and benefits spending between 2019-20 and 2033-34. We have not updated that analysis this year, due to resources being committed to preparation for the July Budget, but the results should remain meaningful. They showed that by 2033-34:

[2] See Table 1 of Belinga *et al* (2014).

- fiscal drag would increase tax revenues by 2.1 per cent of GDP if tax thresholds and allowances were raised in line with inflation; and

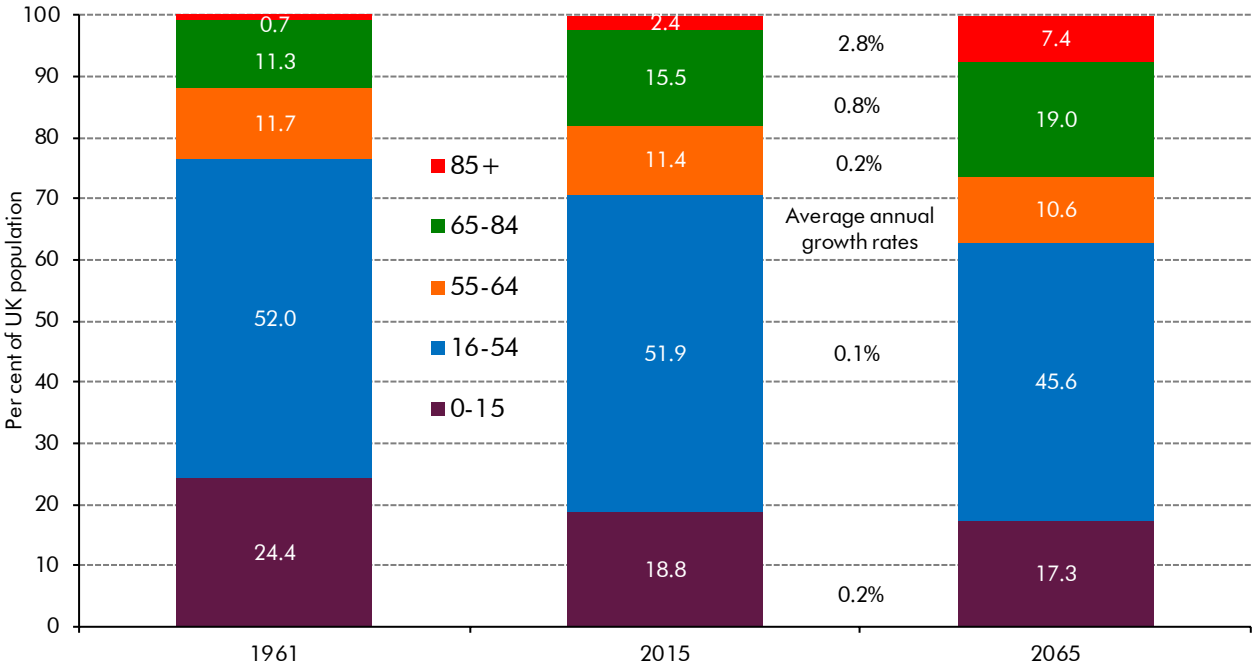
- spending on working-age benefits would be 1.3 per cent of GDP lower and spending on those pensioner benefits not uprated by earnings or the 'triple lock' in the medium term would be 0.3 per cent of GDP lower.

Demographics

3.15 One of the most important inputs into our long-term public finance model is a projection of the size and structure of the future population. This has significant implications both for the future size of the economy and for the future of the public finances. The projected size and structure of the population are determined by assumptions regarding longevity, fertility and net migration. As illustrated in Box 3.3 of last year's report, changes in these assumptions cumulated over a period of decades can have big effects, with implications for the public finances. We therefore test the sensitivity of our projections to alternative population projections later in the chapter.

3.16 We can be reasonably certain about some developments in population structure. In particular, we can be confident that the demographic bulge created by the post-WWII baby boom will continue to pass through the projections as these cohorts age. In addition, past trends of declining fertility and increasing longevity have created what is usually termed an 'ageing population'. Chart 3.1 demonstrates this phenomenon by showing how the central population structure has evolved over roughly the last 50 years and how it is projected to evolve over the next 50 years, in particular the additional growth in the number of people aged 85 and over compared to growth in other age bands. It is this ageing of the population that has the greatest impact on long-term prospects for the public finances, if we assume (as we do in our central projection) that spending on different public services is held constant as a share of GDP for people of particular ages.

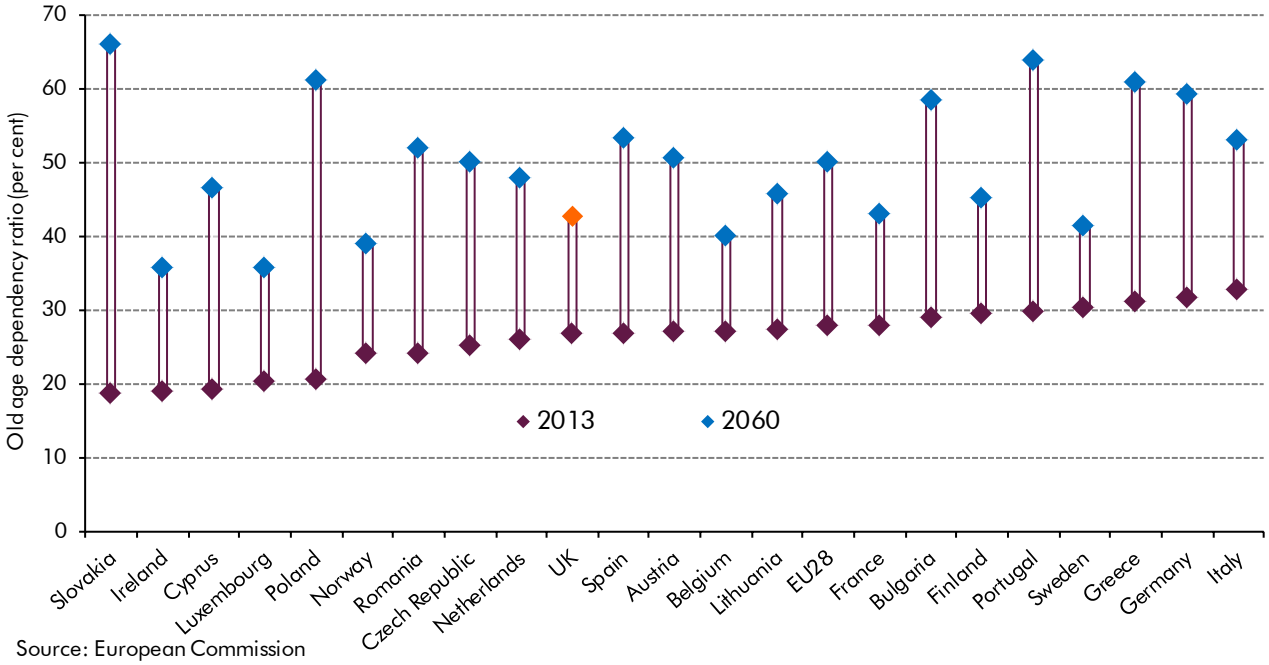
Chart 3.1: Population structure in 1961, 2015 and 2065



Note: 1961 is England and Wales only.
Source: ONS

3.17 The UK is not alone in having an ageing population. Many advanced economies will face similar pressures. Chart 3.2 shows the projected changes in the old-age dependency ratio, defined as the number of people aged over 65 as a percentage of those aged between 15 and 64, for European Union (EU) countries. The chart shows that the average dependency ratio within the EU is currently higher than the UK and is projected to rise more quickly over the coming 50 years.

Chart 3.2: Projections of the old-age dependency ratio in Europe



Source: European Commission

3.18 As in last year's report, our projections are based on ONS population projections using mid-2012 population data. But population estimates are now available up to mid-2013. These imply a slightly bigger actual population, around 18,500 above that assumed in the ONS's principal projections (and around 25,800 above its low migration variant). In the year to mid-2014, net migration averaged 260,000, 95,000 above the principal projection (and 110,000 above the lower migration projection). It increased further to 318,000 over 2014 as a whole. In our March *EFO*, we shifted the basis of our forecast from the low migration projection to the principal projection in light of this evidence. That still meant net migration falling to 165,000 by 2019, but higher than the 105,000 that had underpinned our previous medium-term forecast. We have also switched our central projections in this *FSR* to be consistent with the ONS principal population projections. As always, we illustrate the sensitivity of our projections to different net migration assumptions.

3.19 In our March forecast, we also took on the implications of recent ONS data suggesting the total fertility rate in 2014 had fallen and evidence from the state pensions system that the mortality rate was slightly higher than assumed. These assumptions affected our forecasts of relevant social security and tax credits spending. For the purposes of our long-term projections, we have not attempted to anticipate how the next ONS population projections will factor in the latest evidence of much higher net migration, and smaller changes in fertility and mortality rates. Our projections therefore implicitly assume that any differences with the ONS's principal assumptions quickly unwind.

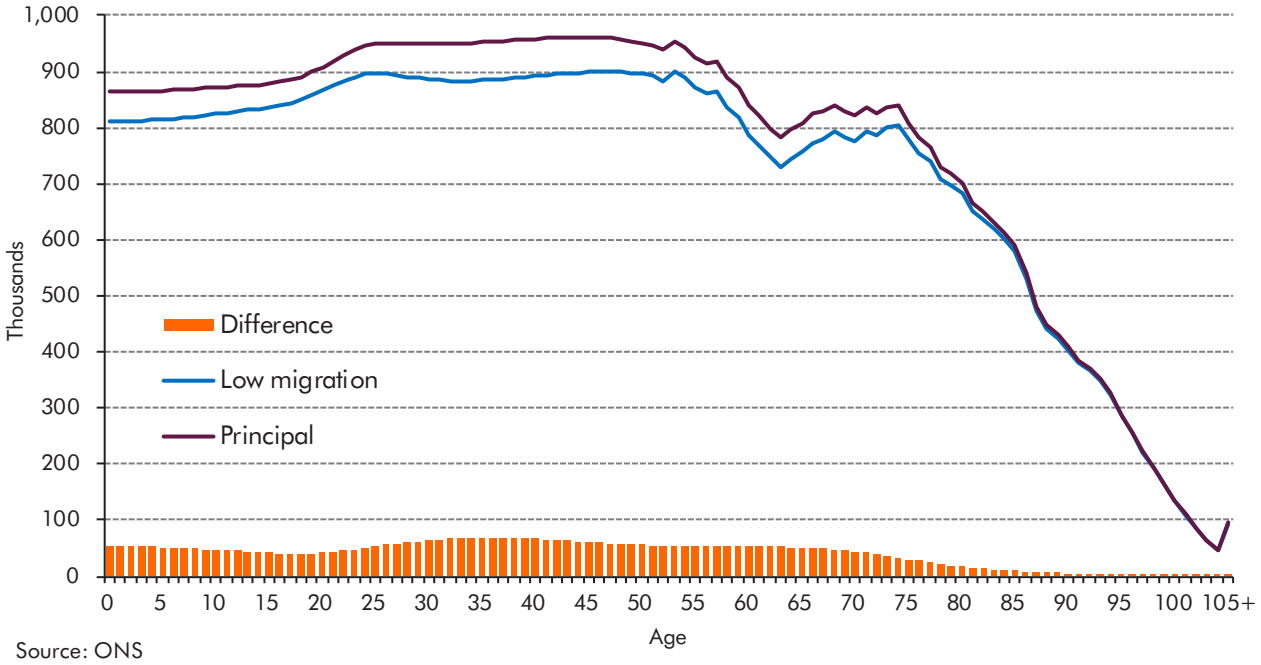
3.20 To illustrate the effect of changing from the low migration to the principal population projections over the long term, Chart 3.3 shows the difference between these projections by single year of age in 2065. As the fertility rate and life expectancy assumptions are the same, it shows how higher net migration boosts the working-age population (given the age structure of inward migrants) and also the number of children (given assumed age-specific fertility rates). Overall, while the total population is 5.6 per cent larger, the working-age population is 6.5 per cent larger while the population aged 65 and over is just 3.4 per cent larger. This means the old-age dependency ratio is slightly lower at 0.47 rather than 0.48 in 2065. Even a small difference like this has important implications for the public finances, as the rest of this chapter will show. (Table 3.3 summarises the different population variants used in this chapter.)

Table 3.3: Population variant assumptions

	Fertility rate	Life expectancy at birth in 2037 (years)		Long-term average annual net migration (thousands)	Size of population in 2065 (million)	
		Males	Females		16-65	Total
OBR central[1]	1.89	84.0	87.3	165	46.2	80.6
High migration	1.89	84.0	87.3	225	49.0	84.9
Low migration	1.89	84.0	87.3	105	43.3	76.4
Young age structure	2.09	81.9	85.5	225	52.1	87.5
Old age structure	1.69	86.2	89.1	105	40.4	74.3

[1] Equivalent to the ONS's 'principal' population variant.

Chart 3.3: Difference between the principal and low migration variants in 2065



Source: ONS

Economic assumptions in the long-term projections

3.21 Our projections for GDP are informed by our view of the average trend in productivity (based on its historical path) and labour supply growth (based on age-specific labour market participation trends and the ONS's population projections). Over longer time horizons, the difference between output growth and the real interest rate paid on government debt is also crucial in determining the dynamics of debt sustainability.

3.22 Table 3.4 lists the underlying long-term assumptions used in our projections, which include small changes in our long-term earnings growth and inflation assumptions since last year's *FSR*. Our latest medium-term economic forecast shows the gap between actual and potential output closing by the end of 2017, and we assume the output gap remains closed thereafter. In reality, actual output will fluctuate around its potential as the economy is hit by unexpected shocks, but we do not attempt to forecast the scale and timing of such shocks. We illustrate the potential impact on our longer-term projections of a number of stylised economic cycles in Box 3.2.

3.23 Our December 2014 forecast rolled forward the medium-term horizon to 2019-20, and so these long-term assumptions are now applied from 2020-21 onwards (with the exception of interest rates, which are assumed to stabilise in 2029-30).

Table 3.4: Long-term economic determinants

Annual growth rate, unless otherwise stated		
Labour productivity	2.2	Based on pre-crisis historical trend
Prices and earnings		
Average earnings	4.5	Product of labour productivity and GDP deflator
Public sector earnings	4.5	Assumed to grow in line with private sector
GDP deflator	2.3	Constant from end of forecast
CPI	2.0	Constant from end of forecast at inflation target
RPI	3.0	Calculated as CPI plus 1.0 percentage points
RPIX	2.8	Calculated as CPI plus 0.8 percentage points
'Triple lock'	4.9	Calculated as average earnings plus 0.39 percentage points
Interest rates (per cent)		
Gilt rate	5.0	OBR assumption
Bank Rate	5.0	OBR assumption
Employment growth		
Public sector workforce growth	0.25	Broadly in line with total employment growth

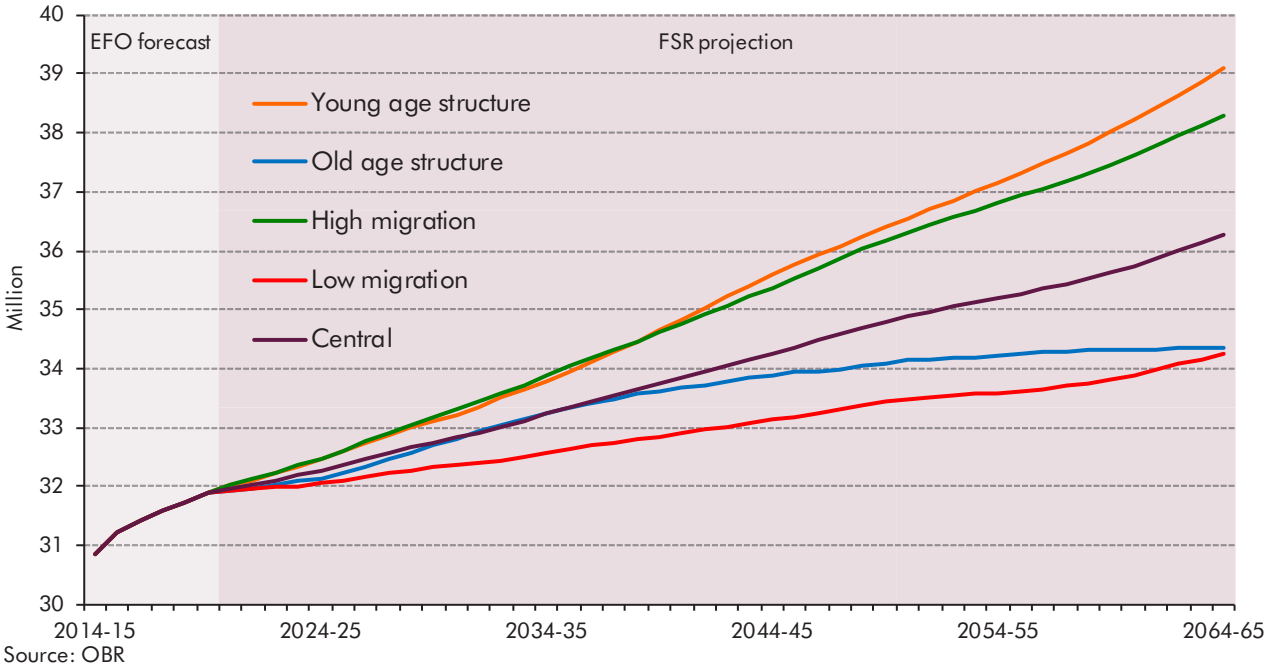
3.24 Our long-term assumption for average productivity growth remains at 2.2 per cent a year, unchanged from last year's *FSR* and consistent with its historical trend prior to the late 2000s recession. We project long-run changes in the proportion of the population in employment using historic labour market participation profiles for different cohorts (by gender and year of birth). This allows us to model the participation rate of current cohorts through the projection period. From this we calculate an employment rate consistent with an assumed non-accelerating inflation rate of unemployment (NAIRU) of 5.35 per cent of the labour force, consistent with our *EFO* forecast. More information on our methodology is contained in Annex B of our 2011 *FSR*.

3.25 We adjust participation rates for changes in the SPA. Although most individuals will choose to exit the labour market before or after they reach the SPA, exit rates do spike around that point. In order to capture the effect on participation rates of raising the SPA, we assume in effect that exit rates move with changes in the SPA, so that a 65 year old when the SPA is 66 has the equivalent exit rate to a 64 year old when the SPA is 65. As in last year's report, we smooth this transition over earlier periods, as individuals would be expected to adapt their labour market participation choices over a longer period. Annex A of our 2014 *FSR* discusses a number of labour market trends in more detail, including employment trends among older workers.

3.26 Combining the population projections with our participation and employment rate projections, we can then project future employment levels as the population ages and cohort sizes vary accordingly, as shown in Chart 3.4. The biggest factor driving these projections is the size of the population rather than the smaller differences in employment rates between the variants, as shown in Chart 3.5. The employment rate is projected to decline over time, as the proportion of older people in retirement increases. Depending on the particular demographic profile, this leads to the long-term real growth rates set out in Table 3.5. (Annual projections are available on our website.)

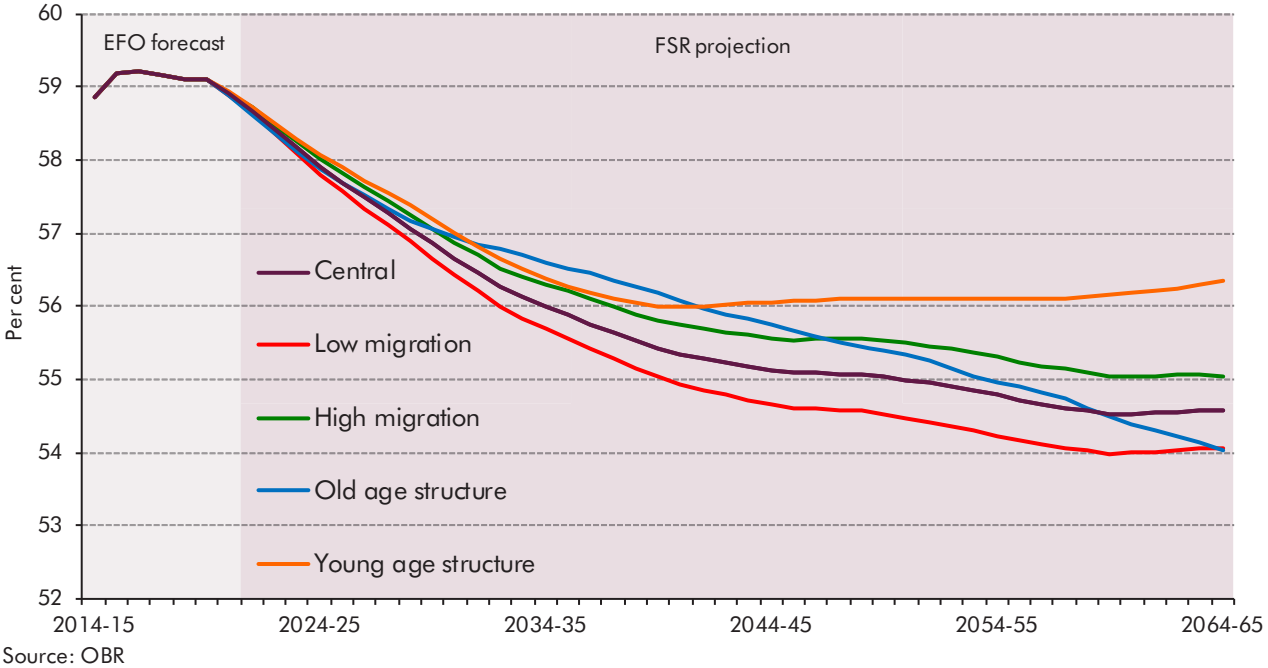
3.27 Our central GDP growth projections are slightly higher than in last year's report, by around 0.1 per cent a year on average, reflecting the move to using the ONS's principal population projections, rather than its low migration variant. Annual average growth in per capita GDP is fractionally higher due to the age structure of the population, but this effect is tiny relative to the boost to overall GDP growth from faster population growth.

Chart 3.4: Employment projections (16+ population)



Source: OBR

Chart 3.5: Employment rate projections (16+ population)



Source: OBR

Table 3.5: Real GDP growth projections

	Annual GDP growth, per cent				
	2014-15 to 2024-25	2024-25 to 2034-35	2034-35 to 2044-45	2044-45 to 2054-55	2054-55 to 2064-65
OBR central	2.4	2.5	2.5	2.5	2.5
High migration	2.5	2.6	2.6	2.6	2.6
Low migration	2.3	2.4	2.4	2.3	2.4
Young age structure	2.5	2.6	2.7	2.6	2.7
Old age structure	2.4	2.5	2.4	2.3	2.2

3.28 We have revised up our assumption for growth in the GDP deflator over the long term from 2.2 to 2.3 per cent a year. This figure is constructed bottom-up using assumptions relating to each of the expenditure components of GDP. We assume that:

- the private consumption deflator rises with CPI over the longer term;
- the business investment and government consumption deflators grow in line with historical averages;
- residential investment prices will rise in line with house prices over the long run, which in turn we assume rise in line with average earnings. We previously assumed this deflator would also grow in line with its historical average. This change explains the revision to the headline GDP deflator; and
- the terms of trade are flat over the long run.

3.29 Since last year, we have also reduced our long-term assumption for RPI inflation from 3.3 to 3.0 per cent a year. As discussed in Box 3.3 of our March 2015 *EFO*, this change reflects a lower estimate of the long-run wedge between RPI and CPI inflation of 1.0 percentage points. We continue to assume CPI inflation remains at 2.0 per cent in the long term, consistent with the Bank of England's inflation target.

3.30 We assume that the labour share of national income is constant in the long run. As a consequence, average earnings growth is equal to the product of labour productivity growth and whole economy inflation, and so rises at 4.5 per cent a year. We assume that the triple lock on pensions uprating will on average lead to higher uprating. This is explained in the pensions section of the chapter.

3.31 Market expectations for interest rates continue to lie below our projections for nominal GDP growth. As in last year's report, we have decided to set the long-term nominal interest rate to 5.0 per cent, which is close to but above our nominal growth rate projections. Changes to our nominal GDP growth projections narrow this differential slightly, but the revision is small in the context of the wider uncertainty around both GDP growth and interest rates. We also assume that the stock of gilts held by the Bank of England's Asset Purchase Facility will naturally run down over time, as the gilts mature and are not replaced.

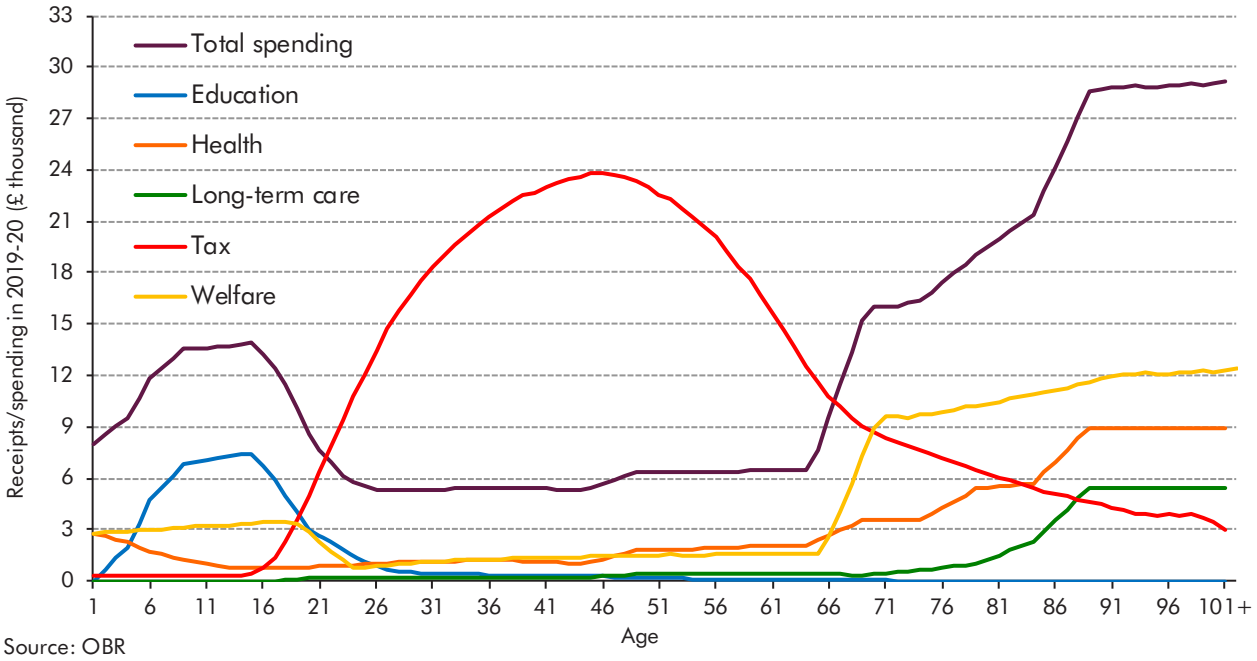
How we project the public finances

3.32 Our projections up to 2019-20 are consistent with our March 2015 *EFO* forecast. From 2020-21, we construct long-term projections of spending and revenue streams through an unconstrained 'bottom-up' analysis. By holding spending and tax revenues per person fixed as a share of their earnings, borrowing would remain unchanged as a share of actual GDP in the absence of demographic changes.

3.33 Key spending and revenue items are sensitive to both the size and age structure of the population, and our approach to projecting the public finances allows us to isolate the changes in both spending and revenue that would be caused by demographic changes. We make use of individual spending and revenue profiles for males and females, each capturing the age distribution of spending or revenue over a representative individual's lifetime. By applying profiles and population projections to spending and revenue it is possible to calculate the total spending per person of a given gender and age, and it is this calculation that forms the basis of our projections of the public finances. These per capita allocations are raised in line with real earnings over the projection horizon and combined with population projections to generate future spending and revenue streams.

3.34 Chart 3.6 shows representative profiles for public service spending items and for tax and welfare. This has been achieved by applying the relevant profiles to the disaggregated forecast in 2020-21. It shows that in early life, people consume a relatively large amount of health care and state-funded education, while parents can claim child benefits and child tax credits on their account. At the same time they will be making little contribution to tax revenues through their income and spending. During working age, they consume fewer public services while also paying more tax, and receiving welfare benefits in some cases. In later life, they consume more health care and long-term care and claim pensioner benefits, in particular the state pension, but pay less tax as their incomes and spending decline.

Chart 3.6: Representative profiles for tax, public services and welfare spending



Source: OBR

3.35 Although we show profiles for welfare and long-term care spending, these are not used directly within our projections. The Department for Work and Pensions projects social security payments using our economic and policy assumptions. This allows us to incorporate the additional complexities of these benefit items explicitly, including changes in the SPA. Projections for long-term care spending are provided by the Department of Health on the basis of Personal Social Services Research Unit (PSSRU) projections of demand for long-term care. Similarly, the Government Actuary's Department (GAD) has projected unfunded public service pension payments, which will add to spending in Chart 3.6.

3.36 As a result of using different modelling inputs, there are varying degrees of detail for different items within our projections. However, this does not mean that the results are any less subject to the uncertainties inherent in any projection looking over such a long horizon.

Spending and revenue projections to 2064-65

3.37 In this section, we present the results of our bottom-up spending and revenue projections, using the methodology and modelling assumptions outlined above. These projections do not represent a precise forecast of the expected evolution of spending or revenue. Rather they show what might happen if policy was to remain unchanged on the basis of the assumptions we have chosen and if our other illustrative assumptions were to hold true. If the projections show the public finances on an unsustainable path, and were to prove accurate, we would expect policymakers to take corrective action.

Revisions and classification changes

3.38 Since last year's *FSR*, the ONS has aligned the UK's National Accounts and public finances data with the 2010 European System of Accounts (ESA10), as well as implementing the conclusions of a review of the public finance statistics. While these changes do not alter the underlying sustainability of the public finances, they do affect the presentation of our projections.

3.39 The revisions raised the level of nominal GDP by more than 5 per cent in 2013-14. The larger changes were in areas that are either unlikely to pay tax (charities and illegal activities) or tax-deductible (research and development). But the revisions do reduce the ratios of fiscal measures expressed as a share of income.

3.40 Classification changes also affected the fiscal aggregates in cash terms. These were explained in our December 2014 *EFO* and have a variety of effects:

- a number of these changes do not affect borrowing or debt, but do affect the composition of receipts and spending (research and development, single use military equipment, VAT contributions to the EU, tax credits and write-offs);
- others alter the point at which borrowing is affected, but do not affect net debt (Royal Mail pension plan, local government pensions and spectrum proceeds);
- some affect net borrowing and net debt over time, but are expected to be neutral over the long run (changing the 'ex measures' boundary, including the treatment of the APF, and the treatment of liquid assets); but
- the reclassification of Network Rail is expected to have a persistent effect on both borrowing and net debt.

3.41 To aid comparisons between our latest and previous projections, we have restated our 2014 *FSR* projections on a basis that is consistent with this year's results. The restated 2014 figures are available on our website.

Public spending

3.42 Table 3.6 shows our central spending projections as a percentage of GDP, excluding interest payments on government debt. The full annual series are available on our website. The big picture is that we project total non-interest public spending to rise from 33.6 per cent of GDP at the end of our medium-term forecast in 2019-20, to 38.0 percent of GDP by 2060-61, before falling slightly to 37.8 per cent of GDP in 2064-65. That would represent an overall increase of 4.2 per cent of GDP – equivalent to £79 billion in today's terms. The main drivers of the increase in non-interest spending are health, state pensions and long-term care costs, due mainly to the ageing population.

3.43 Table 3.7 shows changes since last year's report, once we have adjusted for the classification changes mentioned above. We have extended the projections from that report out to 2064-65, to facilitate comparison between the two sets of figures. The expected increase in non-interest spending between the end of the medium-term forecast and the end of the long-term projection is around 0.4 per cent of GDP less than projected last year. The main changes are:

- revisions to our medium-term forecast affect spending in later years. Lower welfare spending over the next few years, principally due to the lower assumed uprating of benefits (linked to lower inflation) extends to the level of spending in the longer term;
- the Government's spending assumption up to 2019-20 implies higher departmental spending. (Despite total spending being reduced, our debt interest forecast fell by even more, implying less of a squeeze on departmental spending.) Assuming total spending will be flat as a share of GDP in 2019-20 also implies higher departmental spending, as welfare spending falls as a share of national income in that year;
- changes to earnings and inflation outturns and forecasts imply that the triple lock uprating of state pensions has been more costly. We use this as a guide to the uprating of pensions in the long term, which is now further above earnings as a result; and
- assuming that the population will evolve as in the ONS's principal projections rather than its low migration variant lowers total spending as a share of GDP, as the dependency ratio is now projected to be slightly lower (but still rising) in future.

Table 3.6: Non-interest spending projections

	Per cent of GDP						
	Estimate[1]		FSR projection				
	2014-15	2019-20	2024-25	2034-35	2044-45	2054-55	2064-65
Health	7.3	6.2	6.5	7.1	7.6	7.9	8.0
Long-term care	1.1	1.2	1.4	1.7	1.9	2.1	2.2
Education	4.9	4.1	4.2	4.2	4.0	4.1	4.0
State pensions[2]	5.5	5.1	5.4	6.2	6.8	7.0	7.3
Pensioner benefits	0.9	0.7	0.7	0.8	0.8	0.8	0.7
Public service pensions	2.1	2.0	2.0	1.7	1.5	1.2	1.1
Total age-related spending	**21.9**	**19.4**	**20.2**	**21.7**	**22.7**	**23.2**	**23.3**
Other welfare benefits	5.5	4.8	4.8	4.8	4.8	4.8	4.8
Other spending	11.5	9.4	9.4	9.5	9.5	9.6	9.6
Spending[3]	**38.8**	**33.6**	**34.4**	**36.0**	**36.9**	**37.6**	**37.8**

[1] Spending consistent with the March 2015 *Economic and fiscal outlook* .

[2] Includes many items in addition to the basic state pension and single-tier pension, such as pension credit, winter fuel payments, free TV licences and the Christmas bonus.

[3] Excludes interest and dividends.

Table 3.7: Changes in non-interest spending projections since *FSR 2014*

	Per cent of GDP						
	Estimate[1]		FSR projection				
	2014-15	2019-20	2024-25	2034-35	2044-45	2054-55	2064-65
Health	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1
Long-term care	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Education	0.1	0.0	0.0	0.1	0.1	0.0	0.0
State pensions[2]	0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2
Pensioner benefits	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
Public service pensions	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1
Total age-related spending	**0.2**	**0.0**	**-0.2**	**-0.2**	**-0.4**	**-0.5**	**-0.5**
Other welfare benefits	0.0	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Other spending	0.1	0.6	0.6	0.6	0.6	0.6	0.6
Spending[3]	**0.4**	**0.4**	**0.2**	**0.2**	**0.1**	**-0.1**	**-0.1**

[1] Spending consistent with the March 2015 *Economic and fiscal outlook* .

[2] Includes many items in addition to the basic state pension and single-tier pension, such as pension credit, winter fuel payments, free TV licences and the Christmas bonus.

[3] Excludes interest and dividends.

Health

3.44 Table 3.6 shows spending on health rising from 6.2 per cent of GDP in 2019-20 to 8.0 per cent of GDP in 2064-65. This increase is relatively smooth over much of the projection period, before tapering off in the final decade of the projections. The general rise occurs as the population ages, slowing down towards the end as the proportion of the population that are aged 80 and above, who consume relatively more health services, stabilises.

3.45 Spending in 2019-20 is little changed as a share of GDP from last year's *FSR* (adjusted for ESA10 changes). By the end of the period, spending on health is 0.1 per cent of GDP lower, which is largely due to using the principal population projections. This raises both cash spending on health and the cash level of GDP, but GDP by proportionately more.

3.46 As in previous *FSRs*, this is the largest component of age-related spending in our projection, and the wider fiscal outlook is therefore sensitive to what we assume here. As detailed spending plans beyond 2015-16 are yet to be made, we assume spending cuts are spread evenly across all departmental spending, including health. We test this assumption later in the chapter, as well as the assumption that health spending per capita for a person of a given age and gender remains constant as a share of their earnings. The latter might be thought unrealistic given the likelihood that productivity growth in this relatively labour intensive sector will be lower than that in the rest of the economy. Box 3.3 explores this issue in more depth.

Long-term care

3.47 Spending on long-term care is expected to increase from 1.2 per cent of GDP in 2019-20 to 2.2 per cent of GDP by 2064-65, with the path broadly unchanged from last year's projections. The increase over time reflects the combination of an ageing population and reforms announced by the Government, in particular a lifetime cap on the costs that

individuals should have to pay towards their long-term care, with the state paying for the costs to meet eligible needs after the cap is reached.

3.48 Projections for long-term care spending are provided by the Department of Health on the basis of Personal Social Services Research Unit (PSSRU) projections of demand for long-term care. We have scaled up the PSSRU estimates of long-term care spending that underpinned our previous projections, to reflect a slightly broader estimate that is monitored by the Department of Health. All else equal, this would raise the level of spending, but not its yearly profile. But this has been offset by new evidence that residential and nursing care costs have grown more slowly over the recent past than previously assumed.[3]

3.49 There are a number of factors that have affected our estimate of the long-term cost of the lifetime cap on individuals' long-term care costs. Lower care fees imply that people will take longer to reach the cap, so that its cost will rise more gradually and fewer people will claim support at any one time. We also no longer assume that everyone eligible will immediately take up the offer. The proposed cap for working-age individuals has also been restructured, and is now flat at a higher level, rather than rising with age. In sum, these changes have only a small effect, with the reforms still expected to increase spending by 0.3 per cent of GDP in the long term, close to previous estimates.

3.50 We assume that spending on long-term care is driven by demand in the medium and long term, so do not explicitly capture any implications for long-term care spending as a consequence of medium-term spending cuts. This is different to the approach used for other departmental spending.

Education spending

3.51 While education spending is a substantial component of the spending that is driven by demographics, it is not projected to be a source of spending pressure over the coming decades. The switch to the principal population projections implies fractionally higher spending as a share of GDP, reflecting both young migrants and additional births.

3.52 Funding for student loans is treated as a financial transaction, rather than spending, and so is not included in the education line in Table 3.6. We discuss student loans later in this chapter.

State pensions

3.53 Spending on state pensions is projected to rise over the projection period, from 5.1 per cent of GDP in 2019-20 to 7.3 per cent of GDP in 2064-65, driven largely by demographic trends.

3.54 As in previous *FSRs*, we assume that the basic state pension and then the single-tier pension are uprated using the triple lock. The triple lock states that the basic state pension will rise

[3] See Department of Health (2015).

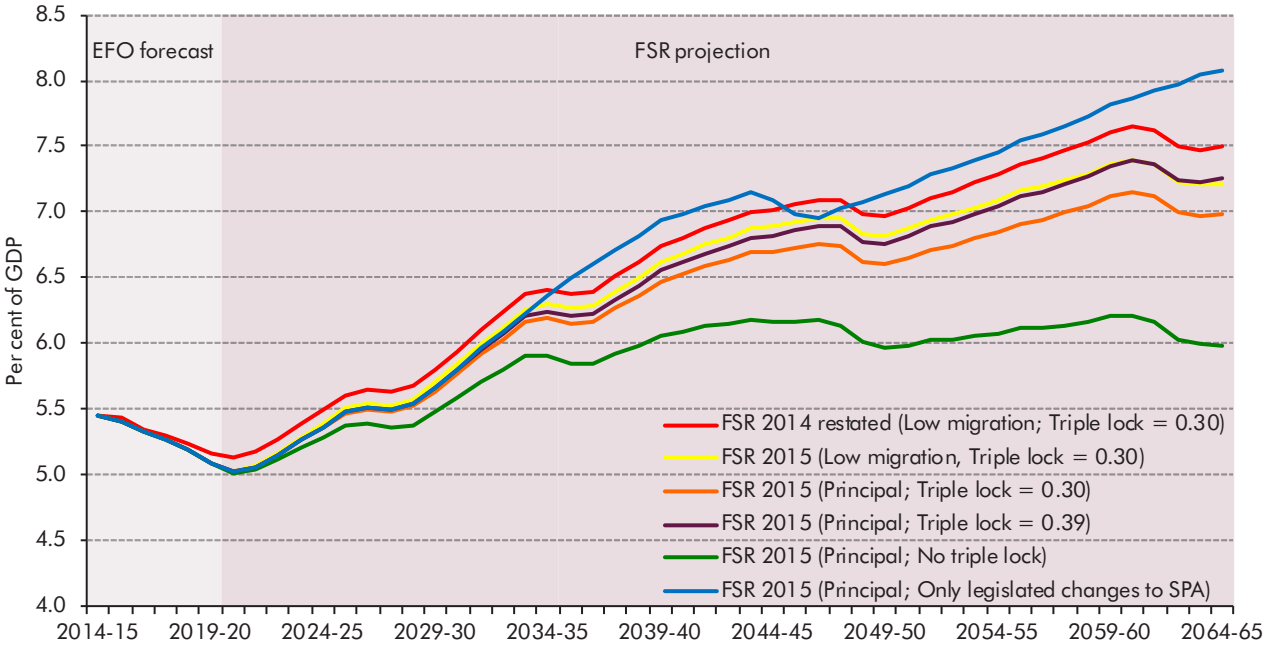
by the highest of earnings growth, CPI inflation or 2.5 per cent. We assume that it applies throughout the projection period. In our central projection, we assume that the triple lock also applies to the single-tier pension, which will be legislated to rise by at least average earnings. The triple lock would see pension spending rise as a share of GDP if earnings growth was higher than nominal GDP growth or if both earnings and GDP growth were low relative to CPI inflation, as we have seen in recent years.

3.55 We assume that the triple lock is equivalent to earnings growth plus 0.39 per cent a year. This figure is calculated as the average additional uprating each year if the triple lock had been applied rather than earnings from 1991 to the end of the medium-term forecast in 2019-20. It is higher than last year's assumption of 0.30 per cent, reflecting the expected additional cost of the triple lock relative to earnings in 2014-15 and 2015-16.

3.56 The central projections presented in Table 3.6 are based on the principal population projections and the latest triple lock assumption. Chart 3.7 shows pensions spending projections using a variety of different assumptions. It shows:

- last year's central projection based on the ONS low migration variant, but restated for GDP revisions, which provides the baseline against which to compare this year's projection;
- our 2015 projection based on the low migration variant and before changing the triple lock uprating assumption. This shows how the downward revision to state pensions spending in our medium-term forecast, plus other smaller factors, cumulate to reduce spending in 2064-65 by 0.3 per cent of GDP;
- our 2015 projection based on the principal population variant, but still with last year's triple lock assumption. This shows that the effect of the new population assumption lowers spending in all years, and by 0.2 per cent of GDP in 2064-65;
- our 2015 projection under different triple lock assumptions (zero, 0.30 per cent and 0.39 per cent). This shows that the updated triple lock assumption has raised spending by 0.3 per cent of GDP by 2064-65, while the total cost of the triple lock relative to earnings uprating is estimated to be 1.3 per cent of GDP by 2064-65; and
- our 2015 projection, based only on the legislated path for the SPA, absent the assumed increases due to the 'third of adult life' longevity link. This shows that raising the SPA in line with longevity reduces spending by 0.8 per cent of GDP by 2064-65.

Chart 3.7: State pensions spending projections



Source: OBR

Public service pensions

3.57 Gross public service pensions expenditure (i.e. before offsetting member contributions) is projected to fall from 2.0 per cent of GDP in 2019-20 to 1.1 per cent of GDP in 2064-65. To a large extent, this decline reflects the pension reforms that have been introduced since 2010 and the reductions to the public sector workforce implied by the Government's spending assumption. Our projections for cash spending are little changed from last year, with GDP changes – mainly related to using the principal population projections – reducing spending as a share of GDP slightly over time.

3.58 Lower CPI inflation over the near term reduces pensions in payment and estimates of career average earnings under the reformed schemes. The first effect is temporary, as most of the pensions of current and deferred pensioners will have ceased by the end of the projection. The second effect is more persistent, but relatively small over a long-term horizon. The combined effect of changes to earnings and workforce growth up to 2019-20 since last year's report also broadly net out over the period.

3.59 Employee member contributions to public service pension schemes, which are treated as negative spending, are included in the 'other spending' line of Table 3.6. Contributions fall as a share of GDP over time, with net contributions moving from 1.6 per cent of GDP in 2019-20 to 0.7 per cent in 2064-65.

3.60 The public service pensions line in our *EFO* forecasts also nets off employer contributions. Employer contributions are a transfer from one part of the public sector to another and are therefore fiscally-neutral, showing up as positive spending in departmental expenditure limits and negative spending in public sector pensions.

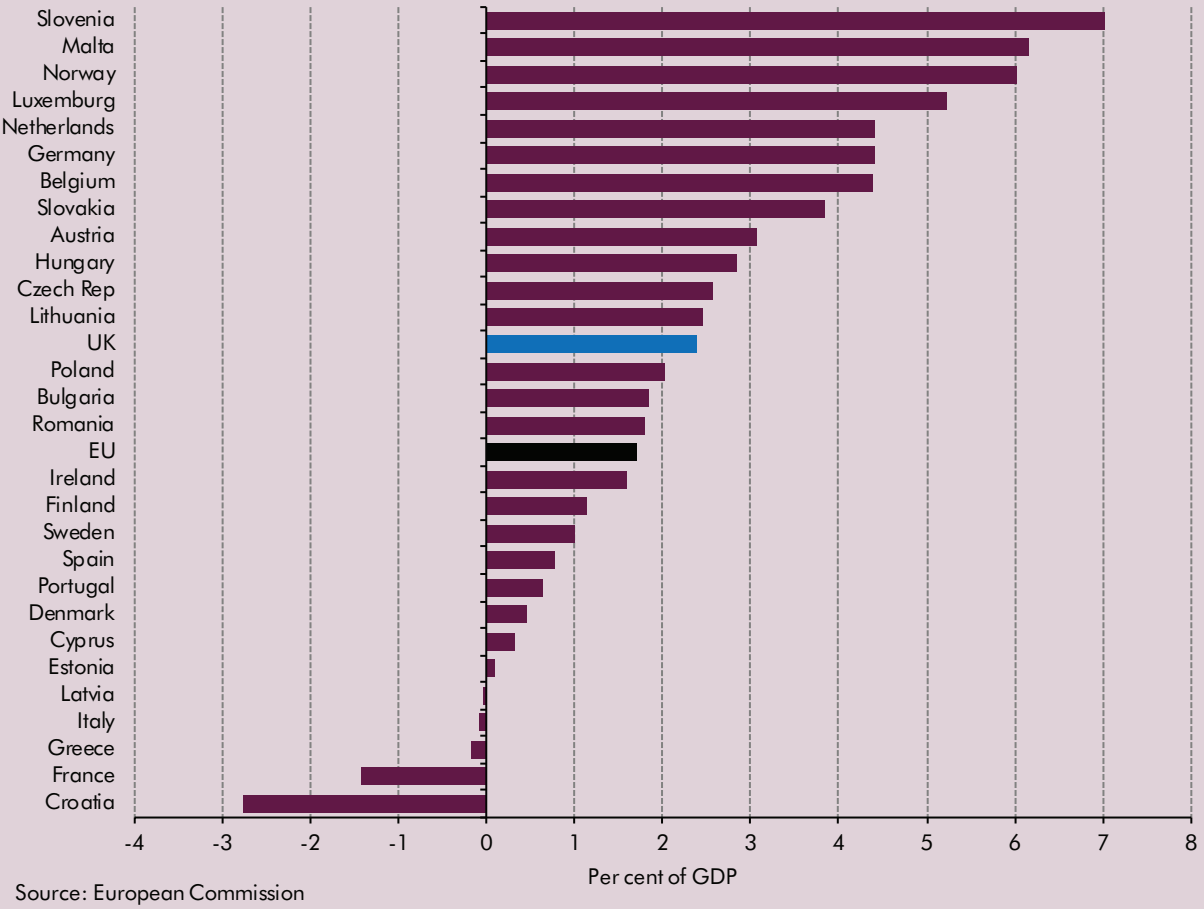
Box 3.1: Age-related spending projections in Europe

Our long-term projections suggest that, if left unaddressed, the public sector finances would come under increasing pressure over the next 50 years due to rising age-related expenditure. Such pressures are common to most developed countries, as shown in the European Commission's latest *Ageing Report* published in May 2015, which contains long-term fiscal projections for EU Member States.

Age-related spending – pensions, health care, long-term care and education – is projected to rise by around 2 per cent of GDP between 2020 and 2060. But, as shown in Chart A, there is considerable variation across Member States, with age-related pressures in the UK described as 'moderate', raising spending by 2.3 per cent of GDP. Among the larger countries, the public finances in Germany and the Netherlands are projected to be under greater pressure, while in France and Italy the projections are more favourable (mainly driven by changes in the underlying demographic and economic assumptions).

The Commission's latest projection for the rise in UK age-related spending has been revised down from 3.3 per cent of GDP in the 2012 *Ageing Report*. The difference stems largely from changes to the State Pension age and the 2016 introduction of the single-tier pension, both of which have been legislated for since the 2012 report and reduce pressure on pensions spending over time.

Chart A: Change in age-related spending in the EU (2020-60)



Source: European Commission

Table A compares the Commission's and our projections for the four main elements of age-related spending. As the Commission does not factor in the spending cuts in our medium-term forecasts, we focus on the projected changes between 2020 and 2060. The table shows that:

- the projected rise in **pensions** spending is somewhat higher in our projections. This reflects the net effect of two key assumptions. We assume the longevity link will result in the State Pension age rising beyond the currently legislated path, whereas the Commission only factors in legislated changes. But, more than offsetting that, we assume a long-term cost of uprating pensions in line with the triple lock, which the Commission does not include as it is not currently a legal requirement of the state pensions system;
- the projected rise in **health** spending is considerably higher in our projections. The difference of approach over the medium term is most apparent in this comparison. But despite the higher starting point, the Commission's methodology and assumptions – notably assuming compression of morbidity in old age (with years of healthy life increasing more quickly than overall life expectancy, reducing age-related pressure on spending) – leads to a smaller rise in spending over the long term. Another difference with our projections is that, in the reference scenario, the Commission assumes an income elasticity of 1.1 in the short term, converging to 1 over the long term. By contrast we have an implicit income elasticity of 1 for the entire period. (See Box 3.3 for more on how these and other assumptions affect projections of health spending);
- the projected rise in **long-term care** spending is also considerably higher in our projections. This partly reflects our assumption about the long-term cost of introducing a lifetime cap on individual care costs in the UK, which is not reflected in the Commission's projections; and
- neither set of projections shows **education** spending rising or falling over the long term.

Table A: Comparison of age-related expenditure items

	Per cent of GDP							
	Pensions		Health		Long-term care		Education	
	Level 2020	Change 20-60	Level 2020	Change 20-60	Level 2020	Change 20-60	Level 2020	Change 20-60
Ageing Report 2015	7.4	1.0	8.1	1.0	1.2	0.3	5.1	0
FSR 2015	7.9	1.4	6.2	1.8	1.2	0.9	4.1	0

Other welfare benefits

3.61 Other welfare benefits are essentially flat as a share of GDP over the projection, with changes since last year mainly reflecting updates to the medium-term forecast, and in particular the lower uprating of benefits due to lower inflation. The flat profile reflects our assumption that most working-age benefits will essentially move in line with the share of the population that is of working age. A disaggregation by type of benefit is available on our website and the projections are discussed in more detail in Chapter 2 of our 2015 *Welfare trends report*, published alongside this *FSR*.

Other spending

3.62 Other non-age-related spending includes spending on items such as defence and transport, where we do not assume age-specific profiles. We assume that spending on such items is constant as a share of GDP from 2019-20 onwards. The medium-term path for implied departmental spending is higher than in last year's projections, reflecting the interaction of the Government's medium-term spending assumption with our forecasts for annually managed expenditure.

3.63 The Government's spending assumption up to 2019-20 implies higher departmental spending. Despite total spending being reduced, our debt interest forecast fell by even more, implying less of a squeeze on departmental spending. Assuming total spending will be flat as a share of GDP in 2019-20 also implies higher departmental spending, as welfare spending falls as a share of national income in that year.

3.64 The 'other spending' category also includes write-offs on student loans, which only affect spending once they crystallise. Under the current student loans system, debts unpaid after 30 years will be written off, and so increase spending at that point. We project that this will increase write-offs from small amounts at present to around 0.2 per cent of GDP from the mid-2040s.That figure is fractionally lower than last year because we have reduced student numbers in our medium-term forecast (implying less principal and interest to write-off) and lowered the long-term RPI assumption (also implying less interest to write-off).

Receipts

3.65 As with spending, the revenue projections from 2019-20 presented in Table 3.8 reflect changes in the absolute size and age composition of the population. Non-interest revenues are projected to be broadly flat as a share of GDP over the projection period, rising slightly from 35.7 per cent of GDP in 2019-20 to 35.9 per cent of GDP in 2064-65.

3.66 This relatively flat picture depends crucially on our assumption that tax allowances and thresholds are uprated in line with earnings rather than prices over the longer term. An ageing population may be expected to lead to a modest increase in the receipts-to-GDP ratio, as older groups usually continue to pay income tax (on pensions), VAT, capital taxes and council tax, even though they are not directly contributing to GDP via earnings.

Table 3.8: Non-interest receipts projections

	Per cent of GDP						
	Estimate[1]		FSR projection				
	2014-15	2019-20	2024-25	2034-35	2044-45	2054-55	2064-65
Income tax	9.0	9.8	9.8	9.8	9.8	9.9	9.9
NICs	6.0	6.4	6.4	6.3	6.3	6.3	6.2
Corporation tax	2.3	2.1	2.1	2.0	2.1	2.0	2.0
VAT	6.1	5.9	6.0	6.0	6.0	6.0	6.0
Capital taxes	1.3	1.8	1.8	1.9	1.9	1.9	1.9
Other receipts	10.6	9.8	9.8	9.8	9.9	9.9	9.9
Receipts[2]	**35.4**	**35.7**	**35.8**	**35.8**	**36.0**	**36.0**	**35.9**

[1] Receipts consistent with the March 2015 *Economic and fiscal outlook*.

[2] Excludes interest and dividends.

Table 3.9: Changes in non-interest receipts projections since *FSR 2014*

	Per cent of GDP						
	Estimate[1]		FSR projection				
	2014-15	2019-20	2024-25	2034-35	2044-45	2054-55	2064-65
Income tax	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
NICs	-0.1	0.0	0.0	0.1	0.1	0.1	0.1
Corporation tax	0.1	0.0	0.0	0.0	0.0	0.0	0.0
VAT	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital taxes	-0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other receipts	0.7	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Receipts[2]	**0.4**	**-0.4**	**-0.4**	**-0.3**	**-0.3**	**-0.3**	**-0.3**

[1] Receipts consistent with the March 2015 *Economic and fiscal outlook*.

[2] Excludes interest and dividends.

3.67 Compared to last year's projections (adjusted for GDP revisions and classification changes), income tax is 0.1 per cent of GDP lower across the projection. This is mainly driven by downward revisions in the medium-term forecast, which in turn reflect a lower effective tax rate on earnings.

3.68 National insurance contributions (NICs) are 0.1 per cent of GDP higher than in last year's report, reflecting both the medium-term forecast and switching to the principal population projections, which increases the proportion of the population that is of working age. People above the SPA are exempt from paying employee NICs. As was the case in last year's projections, raising the SPA therefore expands the pool of people required to pay employee NICs. To the extent that people also choose to work for longer, both personal taxes and GDP increase in cash terms. Given the progressive nature of the tax system and the fact that people working at older age tend to have lower incomes (partly due to working fewer hours on average), the effective tax rate would be expected to fall slightly.

3.69 Capital tax revenues are expected to rise from 1.3 per cent of GDP in 2014-15 to 1.8 per cent of GDP in 2019-20 and to 1.9 per cent of GDP in 2064-65. The near-term increase reflects changes in asset prices – for example, house prices are assumed to rise faster than

earnings in our medium-term forecast. Over the longer term, capital taxes are also affected by the ageing of the population, as those nearing retirement or in retirement are assumed to sell businesses and other financial assets.

3.70 Changes to other receipts over our medium-term forecast period also knock through to the longer term, including the effects of lower inflation on the uprating of excise duties, council tax and business rates.

3.71 In previous *FSRs* we have looked at some of the non-demographic drivers affecting the sustainability of tax revenues, including: the fuel efficiency effect on vehicle excise duty; how globalisation affects corporation tax and VAT revenues; and the long-term prospects for UK oil and gas revenues. In Chapter 4 we look again at the prospects for North Sea tax revenues over the next 30 years, which we have updated to reflect recent oil price developments and changes to the policy regime.

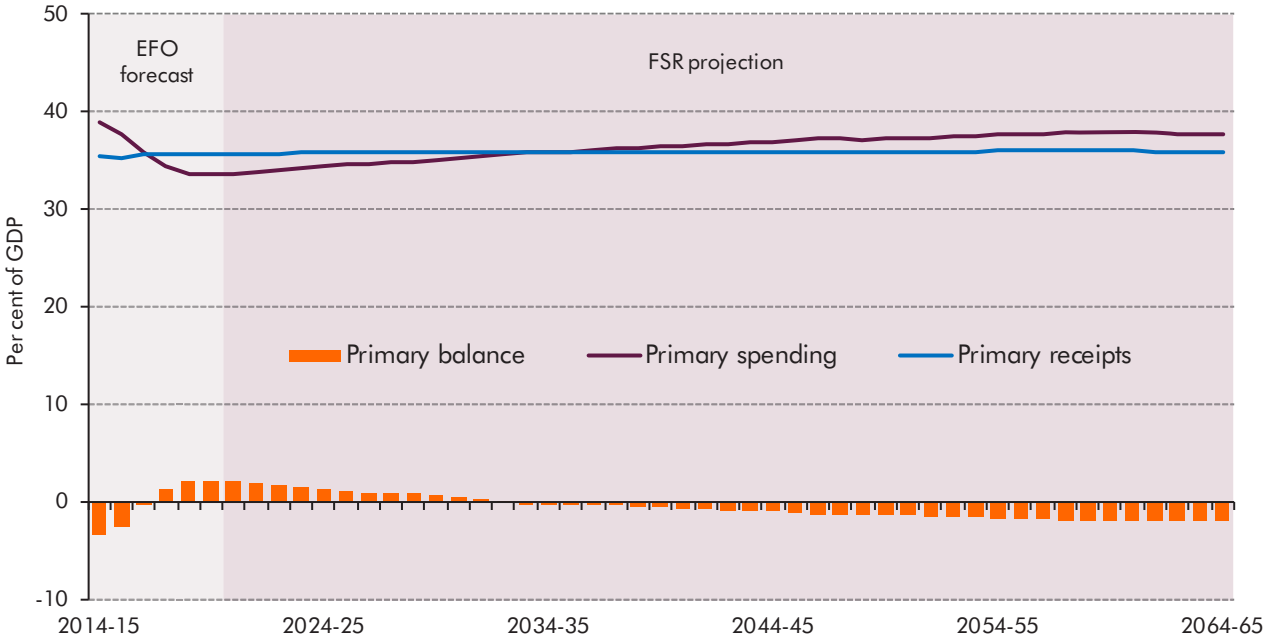
The implications for the public finances

The central projections

Primary balance

3.72 Our central projections show public sector non-interest spending increasing as a share of GDP beyond the medium-term forecast horizon, gradually rising towards and then exceeding non-interest receipts. As a result, as shown in Chart 3.8, the primary balance (the difference between non-interest or 'primary' receipts and spending) is projected to move from a surplus of 2.1 per cent of GDP in 2019-20 to roughly balance in the mid-2030s and then to a deficit of 1.9 per cent of GDP in 2064-65 – an overall deterioration of 4.0 per cent of GDP, equivalent to £73 billion in today's terms. In effect, we project that over the best part of five decades these primarily demographic pressures would reverse around two-fifths of the improvement to the primary balance of 9.8 per cent of GDP that we expect to see between 2009-10 and 2019-20, which includes the reversal of the Labour Government's fiscal stimulus package and the Coalition Government's fiscal consolidation.

Chart 3.8: Non-interest receipts and spending and the primary balance



Source: OBR

Student loans and other financial transactions

3.73 In order to see how this projected deterioration in the primary balance would feed through to public sector net debt, we also need to take into account future financial and other transactions. These raise net debt by increasing the government's cash requirement, even though they do not affect public sector net borrowing.

3.74 For the majority of financial transactions we assume that there is a net effect of zero over the projection period, with the main exception being student loans. We also allow for the winding down of Bradford & Bingley (B&B) and NRAM plc, the Asset Purchase Facility, and historic gilt premia. A number of ESA10 changes affect net borrowing, but not net debt, and so we have also introduced some accruals adjustments to offset these.

3.75 At Autumn Statement 2013, the Government announced its intention to sell part of the student loan book, which it expected would raise around £12 billion over five years from 2015-16. This intention was reiterated in Budget 2015. The Government informed us at the time that the sale in 2015-16 remains its firm intention, but that there had been changes in the form of the expected sale relative to that which underpinned our previous forecast assumptions. While the preparations for the sale are still at an early stage and significant uncertainties remain, one implication is that it is likely that a larger quantity of loans would need to be sold to meet the Government's £12 billion central estimate for the proceeds from the sale. The Government has confirmed to us that it intends to proceed on that basis.

3.76 Selling the loan book affects the flow of receipts, with more recorded upfront as sales proceeds, and less in future years, as future loan repayments will flow to the private sector rather than the Exchequer. We have made a neutral assumption that sales will be evenly spread across the five years beginning 2015-16, implying that few repayments are received

by the Exchequer beyond 2019-20. In effect this crystallises losses on the loans sold: the level of debt is permanently higher relative to no loans having been issued, due to the interest rate and write-off subsidies implicit in student loans.

3.77 Chart 3.9 shows our projection for the total addition to the stock of debt over time, reflecting loans issued, repayments and the proceeds from loan sales. Projections for English loans have been modelled bottom-up, and we assume that other loans and repayments grow broadly in line with English flows.

3.78 Adjusting for revisions to GDP, last year's cash projections were consistent with student loans adding 5.5 per cent of GDP to net debt in 2019-20, with the impact peaking at 9.3 per cent of GDP in the late 2030s, before falling to 7.9 per cent of GDP in 2064-65. In this year's projections, the impact peaks at 8.8 percent of GDP in the late 2030s before falling to 8.0 percent of GDP in 2064-65. The main drivers of the trend shown in the chart include:

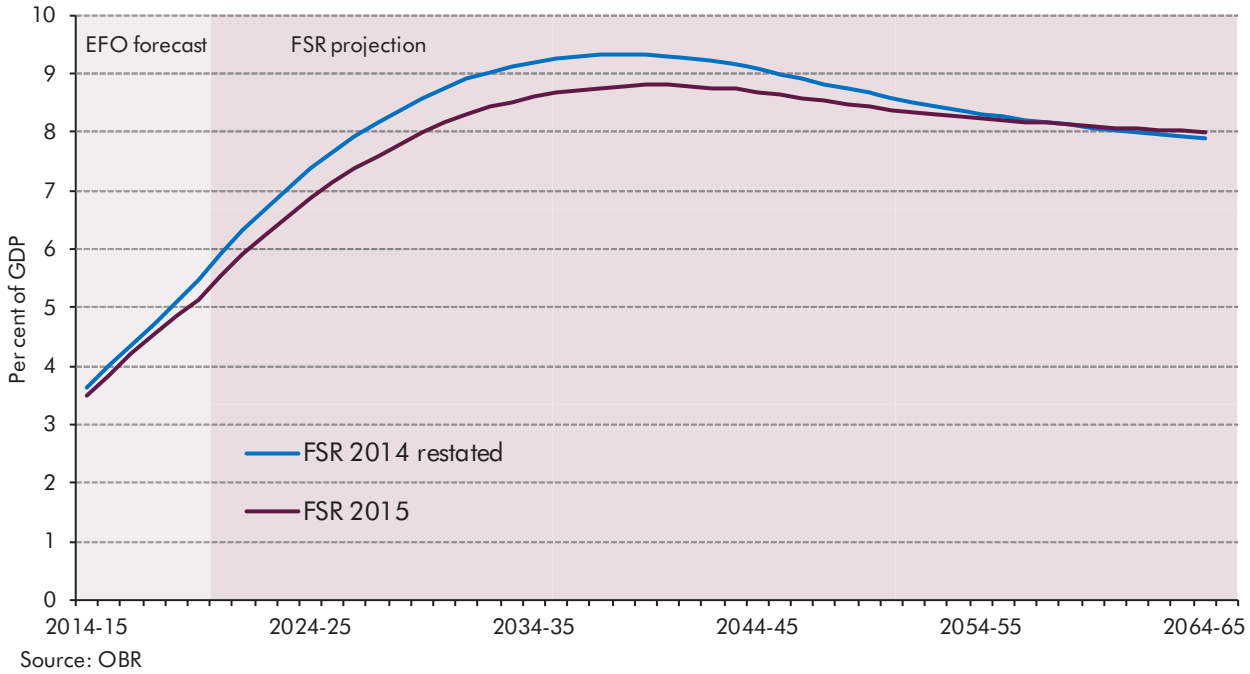
- outlays are now expected to be marginally lower in each year, mainly reflecting our assumption that the number of students will now rise more gradually over the near term, which knocks through to later periods. Student numbers in England have risen this year following the removal of the higher education numbers cap, but have done so by considerably less than assumed. Applications data also imply a smaller rise next year, and so we now assume that student numbers will stabilise at a lower level over the next five years;

- repayments are also expected to be lower over the long term. This reflects lower student numbers and also modelling changes. We now project prepayment rates to be significantly lower, given the average loan size and expectations of write-offs. Repayments have also been reduced by our lower assumption for RPI in the long term (which increases the interest charged on these loans), although this has only a small effect – in part because some of this reduction shows up as lower write-offs rather than lower cash repayments;

- moving to the principal population projections has little impact on outlays and repayments as shares of GDP, but slightly reduces the stock impact on debt, as historic loans fall more quickly as a proportion of rising GDP; and

- lower student numbers slow the accumulation of debt over the near term, as they immediately cut outlays but only gradually lower repayments. The ultimate effect is to lower the stock of debt in the long term, but not its profile from year to year. But this is eventually outweighed by other changes, such as modelling of prepayments, so that the peak impact on debt is now 8.8 per cent of GDP by the late-2030s – 0.5 per cent lower than last year's figure – and the impact at the end of the 50-year horizon is 8.0 per cent of GDP – 0.1 per cent higher than projected last year.

Chart 3.9: Additions to net debt from student loans



Source: OBR

Public sector net debt and net interest payments

3.79 With a projection of financial transactions, we can now project public sector net debt and net interest payments. Interest receipts that are netted off include the accrued interest on student loans, although as an accrued measure it does not directly affect net debt.

3.80 Since last year's *FSR*, we have reduced our medium-term forecasts for both interest payments and interest and dividend receipts by roughly proportionate amounts. Lower interest rates have reduced both sides of the account, but debt interest payments have been reduced further by lower inflation and gilt issuance, and receipts have been affected by asset sales. Since interest payments are significantly higher than receipts, the proportionate reduction still leads to net interest payments being 1.0 per cent of GDP lower in 2019-20. This more than offsets the deterioration in the primary balance by that point, so that net borrowing is marginally lower.

3.81 But the reduction in net interest payments unwinds relatively quickly, as we assume that the lower interest rates prevailing at the end of the medium-term forecast will rise to 5 per cent by the late 2020s. And a larger primary deficit leads to interest payments eventually rising above last year's projections.

Table 3.10: Central projections of fiscal aggregates

	Per cent of GDP						
	Estimate[1]		FSR projection				
	2014-15	2019-20	2024-25	2034-35	2044-45	2054-55	2064-65
Primary spending	38.8	33.6	34.4	36.0	36.9	37.6	37.8
Primary receipts	35.4	35.7	35.8	35.8	36.0	36.0	35.9
Primary balance	-3.4	2.1	1.4	-0.1	-1.0	-1.7	-1.9
Net interest	1.6	1.8	1.6	1.7	1.9	2.5	3.3
Total managed expenditure	40.7	36.0	36.8	38.6	39.9	41.1	42.0
Public sector current receipts	35.8	36.3	36.5	36.8	37.0	37.0	36.9
Public sector net borrowing	5.0	-0.3	0.3	1.8	2.9	4.1	5.2
Public sector net debt	80	72	60	54	60	71	87

[1] Estimates are consistent with the March 2015 *Economic and fiscal outlook*.

Table 3.11: Changes in the central projections of fiscal aggregates since *FSR 2014*

	Per cent of GDP						
	Estimate[1]		FSR projection				
	2014-15	2019-20	2024-25	2034-35	2044-45	2054-55	2064-65
Primary spending	0.4	0.4	0.2	0.2	0.1	-0.1	-0.1
Primary receipts	0.4	-0.4	-0.4	-0.3	-0.3	-0.3	-0.3
Primary balance	0.1	-0.8	-0.6	-0.5	-0.4	-0.2	-0.2
Net interest	0.3	-1.0	-0.6	-0.1	0.1	0.1	0.1
Total managed expenditure	0.0	-0.8	-0.5	0.0	0.1	-0.1	-0.1
Public sector current receipts	-0.2	-0.6	-0.5	-0.4	-0.4	-0.4	-0.4
Public sector net borrowing	0.2	-0.2	0.0	0.4	0.5	0.4	0.3
Public sector net debt	0	-1	-1	0	1	2	2

[1] Estimates are consistent with the March 2015 *Economic and fiscal outlook*.

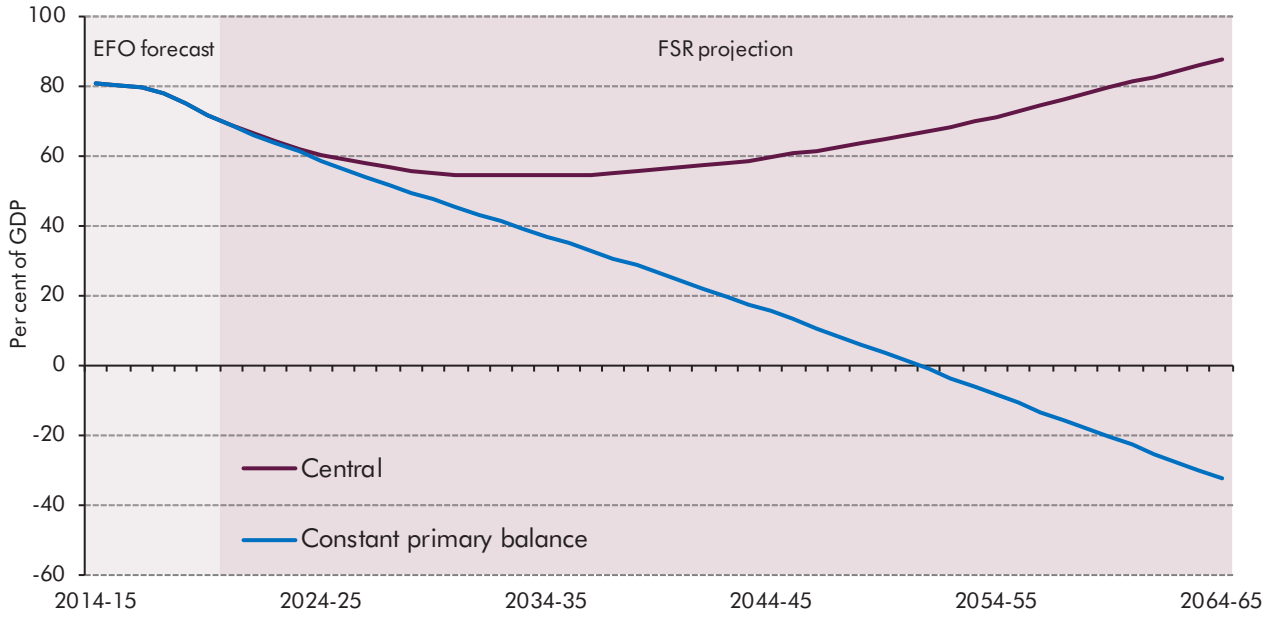
3.82 Charts 3.10 and 3.11 show the paths of public sector net debt and net interest as a share of GDP in our central projection, comparing them to their paths if the primary balance was to remain constant at its 2019-20 level.

3.83 Our central projection of public sector net debt falls from its peak of around 80 per cent of GDP in 2014-15 to around 54 per cent of GDP in the early 2030s, before rising to 87 per cent of GDP after 50 years. Over the comparable 50-year period, adjusting for GDP revisions and classification changes, our 2014 *FSR* projections showed a very similar picture: debt peaking at almost 82 per cent of GDP in 2015-16, bottoming out at around 54 per cent of GDP and reaching 85 per cent of GDP in 2064-65.

3.84 If the primary surplus remained constant at 2.1 per cent of GDP, net debt would be wiped out by the early 2050s. But in our central projection, longer-term spending pressures, if unaddressed, would put the public finances on an unsustainable path in our central projection. Public sector net debt would be only slightly above its recent peak, but still rising at the end of the projections. We quantify this 'unsustainability' more formally in Chapter 5. However, as we always stress, there are huge uncertainties around projections over this time horizon. Below we examine how sensitive our latest projections are to some of the key

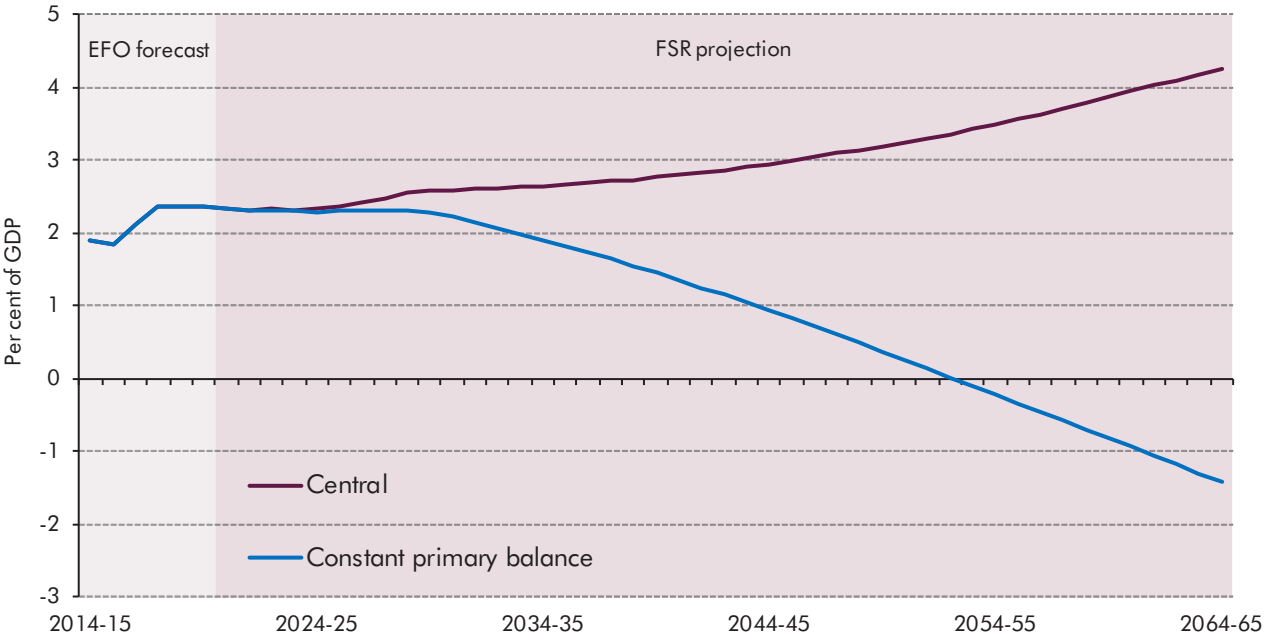
assumptions we have made. Before that we explain the factors driving the change in our projections compared to last year's report.

Chart 3.10: Projections of public sector net debt



Source: OBR

Chart 3.11: Projections of net interest payments



Source: OBR

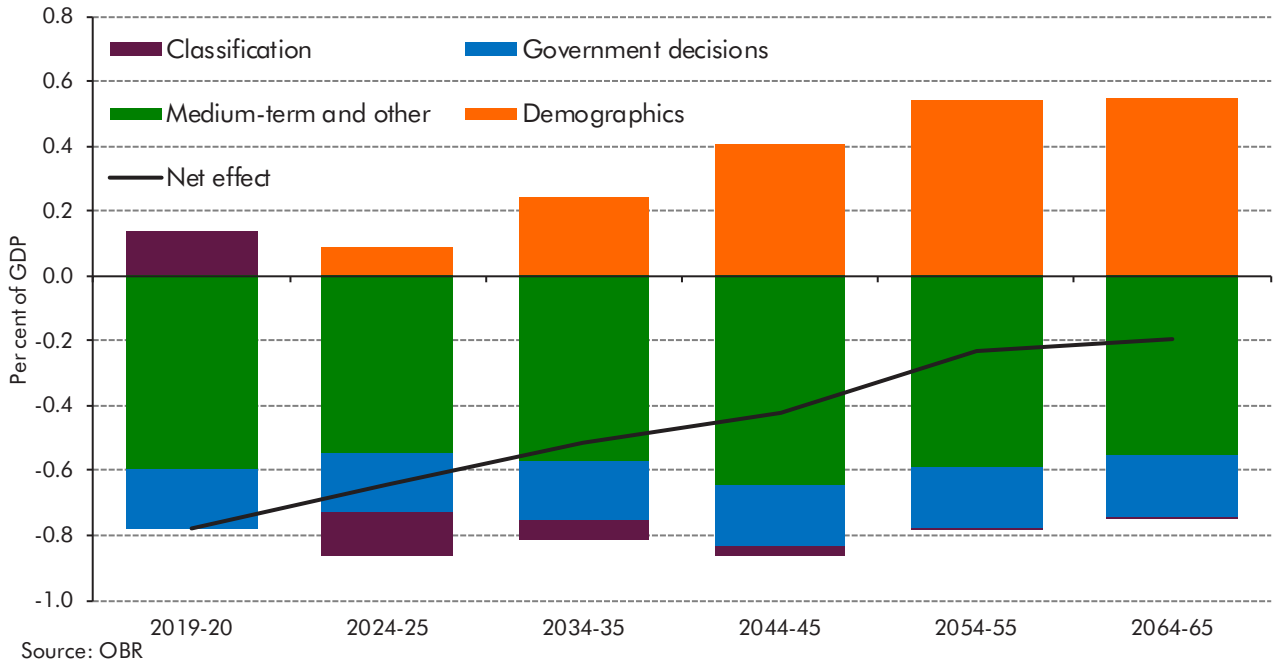
Changes since last year's projections

3.85 Chart 3.12 provides a stylised decomposition of the changes in the primary balance over the projection period since last year's *FSR* (with last year's results on an unadjusted basis,

before removing the effects of ESA10-related changes to cash borrowing and to GDP). Table 3.13 shows a more detailed split for the final year. They show that:

- classification changes have little impact on the primary balance over the long term;
- the headline primary balance has deteriorated since last year's *FSR,* mainly due to underlying changes to our medium-term forecast that persist in future years;
- the Coalition Government's spending assumption implies a rise in departmental spending as a share of GDP in 2019-20 that reduces the balance further. Other policy measures introduced in Autumn Statement 2014 and Budget 2015 were largely offsetting, with little net effect on our projections; and
- switching from the low migration variant to the principal population projection improves the primary balance over time due to the lower old age dependency ratio. Despite this offset, the primary deficit is still 0.2 per cent of GDP wider by 2064-65 than in last year's *FSR*.

Chart 3.12: Decomposition of changes in the primary balance since *FSR 2014*



Source: OBR

3.86 Chart 3.13 and Table 3.13 illustrate the cumulative effects of these changes on our net debt projections. They show that:

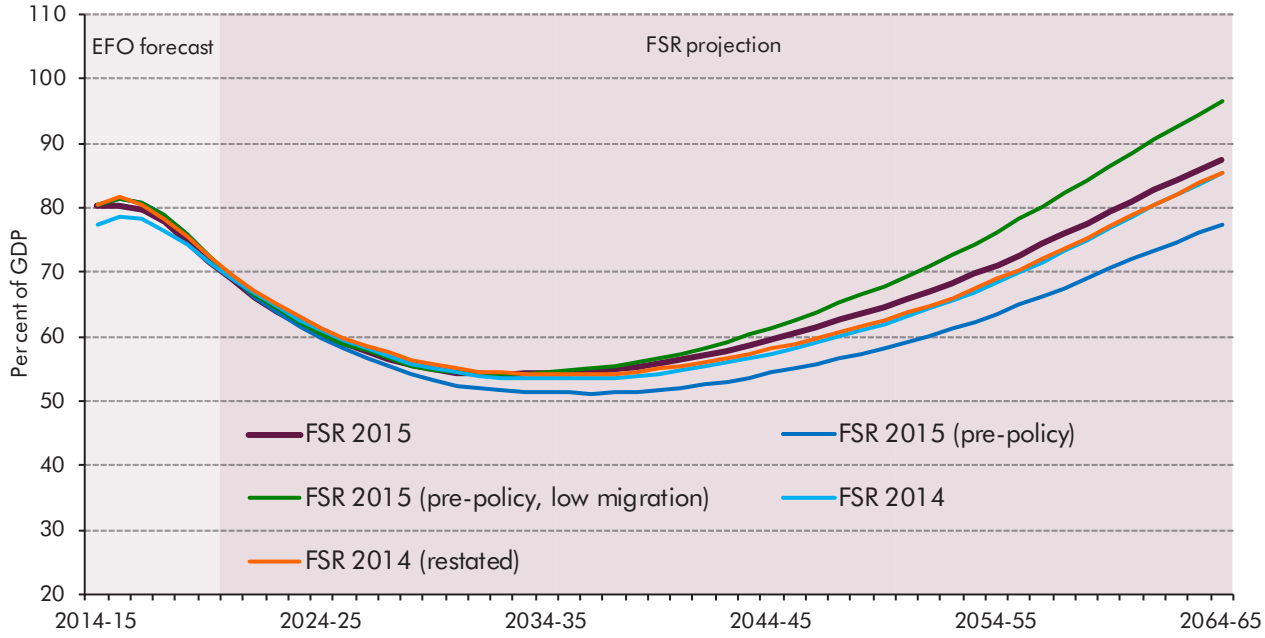
- classification changes have increased net debt as a share of GDP in the near term, but some of the effects are temporary, leaving the ratio unaffected over the long run. Including Network Rail's liabilities raises debt in cash terms across the projection period, but that is offset by ESA10 changes that raise the level of GDP;

- excluding the impact of policy and population changes, net debt would have risen to around 97 per cent of GDP by 2064-65, mainly reflecting the deterioration in the medium-term primary balance set out above. Net interest payments are expected to be lower over our medium-term forecast, but that unwinds as we assume interest rates still settle at 5 per cent in the long term;

- using the principal population projections reduces net debt by almost 20 per cent of GDP by the end of the period, due to a lower old age dependency ratio. Marginally stronger population growth also reduces the assumed gap between interest rates and GDP growth; and

- once policy decisions are taken into account, the profile for net debt is very similar to last year's projections. Asset sales reduce net debt over our medium-term horizon, but these essentially bring cash forward at the expense of higher borrowing in the future. Higher implied departmental spending in 2019-20 has a more persistent effect.

Chart 3.13: Decomposition of changes in the net debt projection since *FSR 2014*



Source: OBR

Table 3.12: Changes in the primary balance and net debt in 2064-65

	Per cent of GDP	
	Primary balance	Net debt
FSR 2014	-1.7	85
FSR 2015	-1.9	87
Change	**-0.2**	**2**
of which:		
Pre-policy measures	**0.0**	**-8**
Classification changes	0.0	0
Demographics	0.5	-19
Medium-term forecast and other	-0.6	11
Policy measures	**-0.2**	**10**

3.87 Neither set of projections includes the crystallisation of any of the contingent liabilities that the Government has accumulated over the recent past and which are discussed in Chapter 2. In isolation, each contingent liability is judged to have a less than 50 per cent probability of being called, but it is certainly possible that some will crystallise over the longer term.

Sensitivity analysis

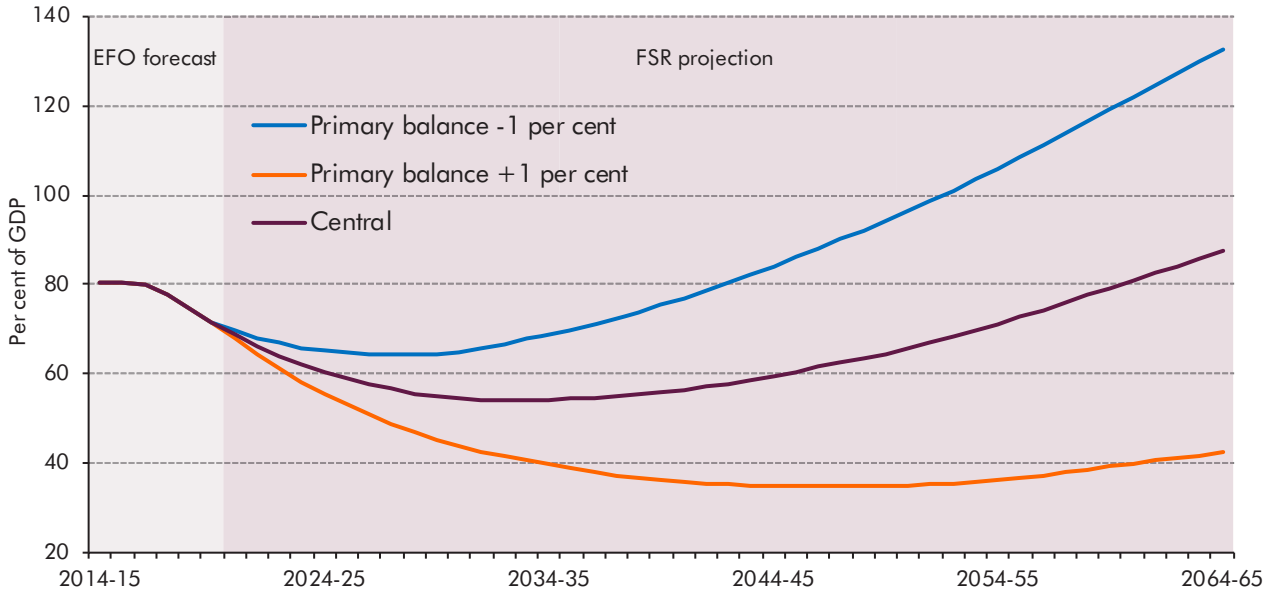
3.88 This section analyses the sensitivity of our central projections to the medium-term fiscal position and to our key demographic and economic assumptions.

Sensitivity to the medium-term primary balance

3.89 Our March *EFO* forecast for 2019-20 is the starting point for our long-term projections. This particular sensitivity illustrates the importance of the gap between spending and receipts at that point, which is locked into the long-term projections, given that we assume that the economy is operating at its long-term trend thereafter.

3.90 Chart 3.14 shows that if the primary balance from 2020-21 onwards was worse by 1 per cent of GDP, then by the end of the period net debt would increase to over 130 per cent of GDP rather than the 87 per cent of GDP in our central projections. Conversely, a structural primary balance that was 1 per cent of GDP better would see debt fall to around 35 per cent of GDP before beginning to rise again.

Chart 3.14: Sensitivity of net debt projections to the primary balance in 2020-21



Source: OBR

Sensitivity to the composition of spending in 2019-20

3.91 Chart 3.14 assumes that a 1 per cent of GDP difference in the initial primary balance persists in all future years. But the composition of spending also matters, and so that margin may be expected to widen or narrow depending on the underlying factors at play.

3.92 In the absence of detailed spending plans beyond 2015-16, there are now four years in our medium-term forecast where total departmental spending is implied by the Government's total spending assumption. We therefore need to make an assumption about the composition of spending in 2019-20, to which our results will be sensitive.

3.93 Our central projection assumes that all types of departmental spending fall proportionately over these four years. This implies health and education spending, the main age-related elements of departmental spending, being reduced by 1.0 per cent and 0.6 per cent of GDP respectively between 2015-16 and 2019-20, equivalent to £22 billion and £14 billion by 2019-20.[4]

3.94 Alternatively we could assume for these four years, as we do beyond 2019-20, that per capita spending by age and gender is fixed relative to potential earnings. Under this scenario, health and education spending would be broadly flat as a share of GDP over these four years. Health spending in particular would rise by 1.2 per cent of GDP or £26 billion in cash terms in 2019-20. The Government would then have to find cuts in other spending of 1.9 per cent of GDP or £42 billion in nominal terms to stick to the announced policy assumption for total spending. As shown in Table 3.13, the effect on the projections

[4] Our long-term projections are based on assumptions about the functional split of spending in 2019-20, as described in the policy assumptions section of this chapter.

of higher spending on education in 2019-20 would be minimal, but higher health spending in 2019-20 would then be compounded by the demographics to increase health spending (and therefore total spending) by a further 0.4 per cent of GDP by 2064-65. Chart 3.15 shows that on this alternative interpretation of unchanged policy towards departmental spending, net debt would rise to 99 per cent of GDP by 2064-65 in the absence of any offsetting changes to other spending or to tax levels.

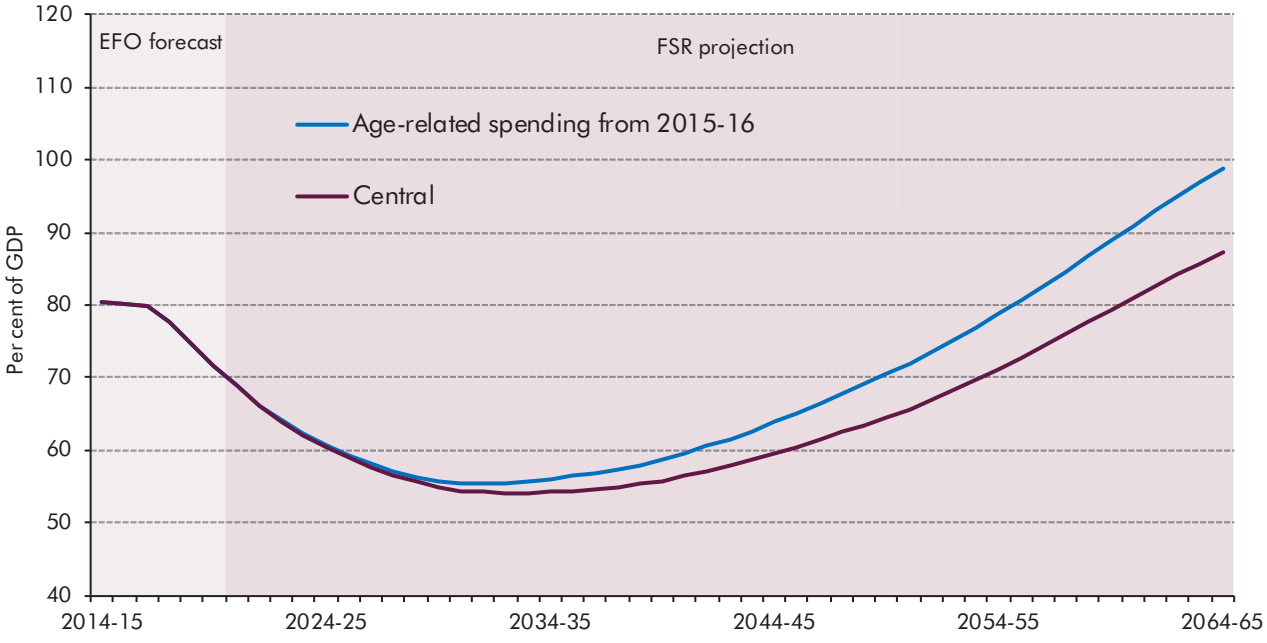
Table 3.13: Non-interest spending projections, assuming age-related spending beyond 2015-16

	Per cent of GDP						
	Estimate[1]		FSR projection				
	2014-15	2019-20	2024-25	2034-35	2044-45	2054-55	2064-65
Health	7.3	7.4	7.8	8.5	9.1	9.5	9.6
Education	4.9	4.8	4.9	4.8	4.7	4.8	4.7
Other non age-related spending	11.5	7.6	7.6	7.6	7.6	7.8	7.8
Spending[2]	38.8	33.6	34.5	36.2	37.2	38.0	38.2
Difference from central projection							
Health	0.0	1.2	1.3	1.4	1.5	1.6	1.6
Education	0.0	0.7	0.7	0.7	0.7	0.7	0.7
Other non age-related spending	0.0	-1.9	-1.9	-1.9	-1.9	-1.9	-1.9
Spending[2]	0.0	0.0	0.1	0.2	0.3	0.4	0.4

[1] Spending consistent with the March 2015 *Economic and fiscal outlook* .

[2] Excludes interest and dividends. Other components of non-interesting spending are unchanged from the central projection.

Chart 3.15: Sensitivity of net debt projections to our assumption on the allocation of spending beyond 2015-16



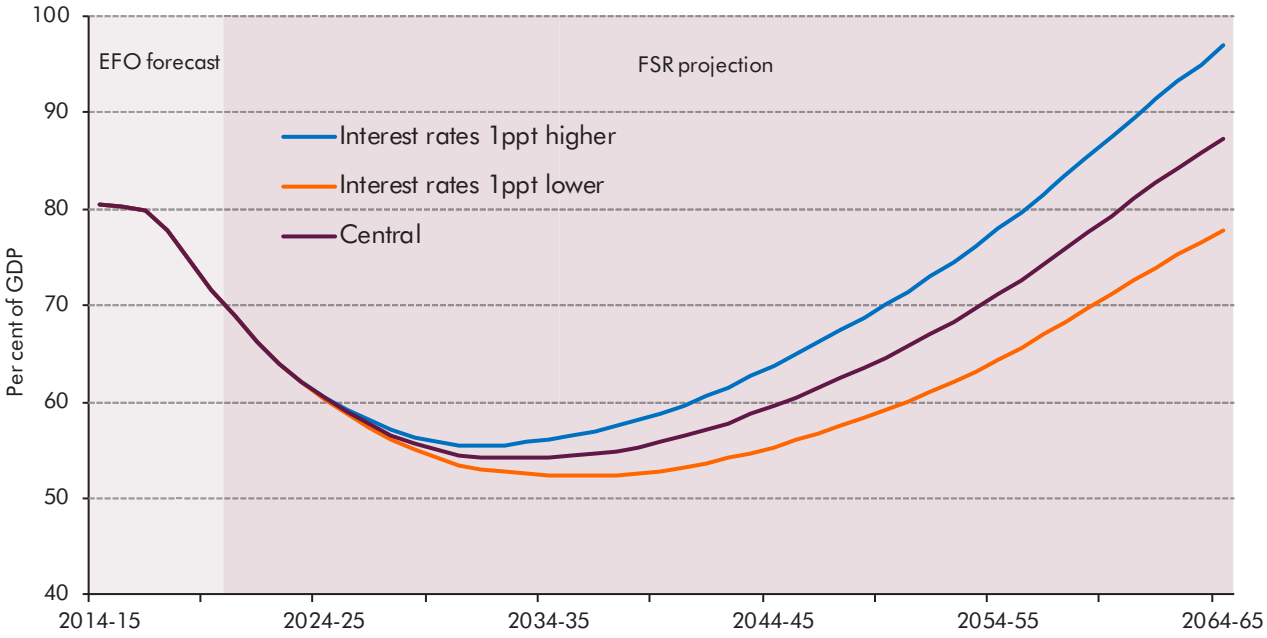
Source: OBR

Sensitivity to interest rates and growth

3.95 Another key assumption is that the interest rate the government pays on its newly issued debt gradually rises to 5 per cent in the long term, slightly above the rate of nominal GDP growth. The gap between the two is a key determinant of long-run debt dynamics. Our projected interest rates are higher than market expectations currently imply over the long term. But gilt rates could end up higher than assumed, for example if demand for safe assets falls as economic uncertainty recedes. There is also uncertainty surrounding our central GDP growth projection.

3.96 Chart 3.16 illustrates the path of net debt if gilt rates were 1 percentage point higher or lower from 2020-21 onwards, but GDP growth remained the same. Over a short time horizon, the impact is relatively small, as changes would only apply to new debt issuance and the UK has a relatively long average debt maturity. But as the stock of debt matures, and the primary balance deteriorates, the effects would increase. A 1 percentage point change in interest rates in the long term would add or subtract around 10 per cent of GDP to net debt over 50 years, with debt climbing more steeply or slowly thereafter.

Chart 3.16: Sensitivity of net debt projections to interest rates



Source: OBR

Box 3.2: Economic cycles and the long-term projections

Long-term projections require simplifying assumptions. By assuming that GDP grows in line with its historical trend, our central projections in effect imply 47 years of uninterrupted trend economic growth. But history tells us that the actual path of output will not be smooth.

We assume that most receipts and benefits are uprated with earnings, which negates any effects from cyclical swings in productivity. One key exception is the uprating of state pensions, where we apply the triple lock, uprating payments by the highest of CPI inflation, earnings growth or 2.5 per cent. The effect is asymmetric: during recessions, when earnings growth might fall below inflation or 2.5 per cent, the triple lock acts as a floor for the uprating of pensions; but it does not act as a ceiling when wages grow faster than either 2.5 per cent or inflation during a boom. We incorporate this effect into our central projections by assuming that the triple lock will, on average, push the annual pension uprating almost 0.4 percentage points above average earnings growth. Without this effect, our debt projection would be lower, ending the period at 61 per cent of GDP, in contrast to our central projection of 87 per cent of GDP.

Cyclical movements in economic activity would be expected to have broader effects on the public finances. We assume that spending on public services is linked to GDP per capita each year. In practice, spending plans are set out in advance and do not automatically adjust to temporary changes in GDP within each period. But receipts move more closely with the economic cycle, as do some parts of welfare spending. To explore the sensitivity of our projections, we illustrate alternative paths for debt as a share of GDP under two stylised economic cycles:

- a symmetric cycle, with the economy alternating above and below its trend level every three years, with peak differences of around 2 per cent of GDP. The average length of this business cycle, and the size of the shock, have been loosely informed by movements of actual GDP over the past relative to a statistically filtered trend; and
- an asymmetric cycle, whereby recessions are deeper and sharper than booms. The recessions reduce GDP by around 3 per cent relative to its potential, and the booms add around 1 per cent, but last almost twice as long. We also assume that the final cycle is bigger than the rest.

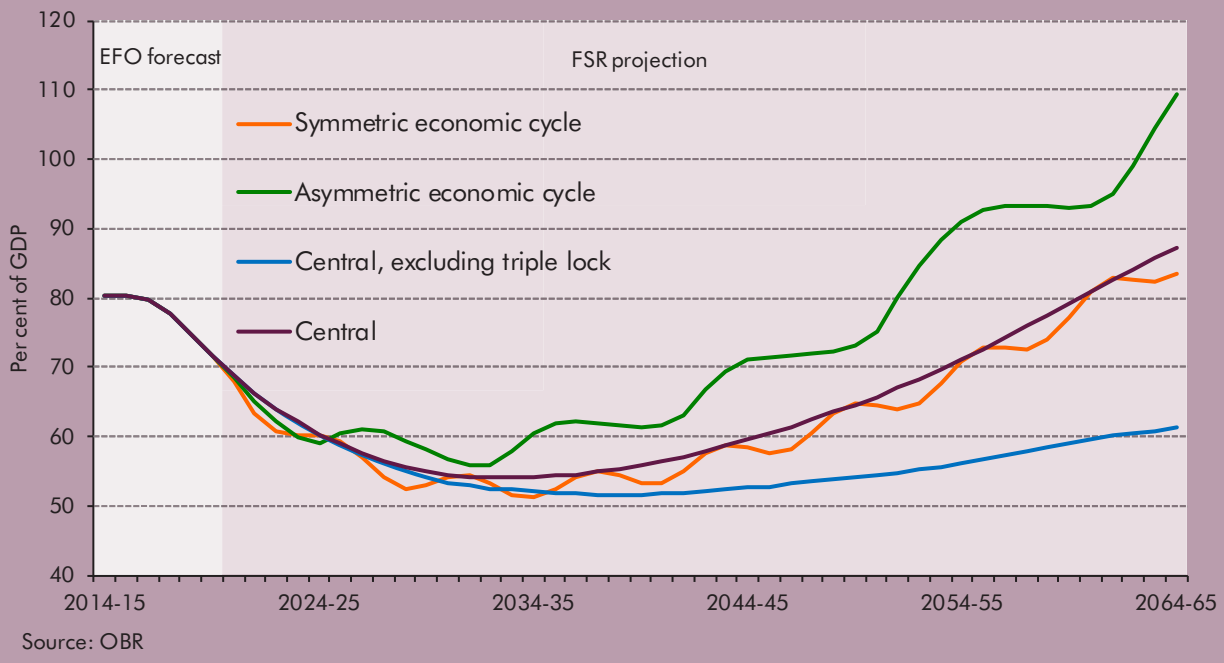
In mapping the fiscal implications, we apply our usual cyclical adjustment ready-reckoner, which assumes that a 1 per cent change in GDP will result in a 0.7 per cent of GDP change in borrowing after two years. The cost of the triple lock has not been modelled separately. The actual change would depend on many factors, including the specific nature of the economic shock and the composition of receipts and spending at the time.

This produces the illustrative projections in Chart B. The main message is that a symmetric cycle would lead to debt bouncing around our central projection (below it in the chart, as we assume that the first economic cycle begins with a boom), but that negatively asymmetric shocks would lead to permanently higher debt, as cyclical changes in the primary balance would have permanent effects raising the amount of debt interest.

Underpinning these projections is the assumption that spending continues to grow in line with potential output. But economic shocks may also have structural consequences that are not

automatically fed through to changes in spending (and/or have longer-run effects on receipts), which could amplify the swings in borrowing and affect how debt accumulates over time.

Chart B: Sensitivity of net debt projections to economic cycles



Source: OBR

Sensitivity to demographic assumptions

3.97 Table 3.3 outlined the alternative population assumptions produced by the ONS, and Chart 3.4 showed our associated employment projections. The sensitivity of our results to these assumptions is presented in Table 3.14, which shows the differences in non-interest receipts and spending compared to our central projection, and Chart 3.17, which shows the impact on public sector net debt.

3.98 The demographic variants we use are the ONS 'young age structure' and 'old age structure' scenarios. We also show the ONS migration scenarios – 'high migration' and 'low migration'. As Box 3.3 in last year's *FSR* illustrated, net migration has proved one of the biggest sources of errors in recent population projections. In 2014 as a whole, net migration is estimated to have reached 318,000, which is considerably above even the high migration variant, let alone the principal and low migration variants.

3.99 The old age structure scenario combines lower fertility and higher life expectancy with lower net migration than under our central projection. Linking SPA changes to life expectancy would imply that successive increases would be necessary in the 2030s in order to catch up to the third-of-adult-life principle, and that the SPA would rise to 75 by the end of our projection period. Our assumptions on the labour market response to SPA changes would imply a higher employment rate for relevant cohorts than in our central projection. We also assume that being in employment does not affect demand for public services, so that spending per person of a given age and gender is unchanged.

3.100 On these assumptions, the primary balance would be in a better position until the late-2040s than in our central projection. Spending on education and welfare payments to pensioners (mainly state pensions) would be lower as a share of GDP and the upward pressures on health and long-term care would be partly offset by higher GDP. Cash receipts would also be higher, but the effective tax rate would fall. However, the relative improvement would eventually dissipate, as costs associated with ageing became larger, and debt would consequently rise faster from a lower level. The primary balance would be lower than in our central projection in 50 years and net debt would be higher. In effect, extending working lives over this period would be a partial down-payment on a higher public services bill in the very long term.

3.101 The young age structure scenario combines a high migration assumption with lower life expectancy and higher fertility to yield a larger working-age population. This boosts receipts growth, with receipts rising gradually as a share of GDP and reaching a level higher than in our central projection. Although the increase in the number of children adds to education costs, and working-age benefits also rise, total spending is lower, in line with reduced pressures on health, long-term care and pensions. The primary deficit is only small by the end of the projection period and so net debt is lower and relatively flat as a share of GDP, reaching around 64 per cent of GDP by 2064-65.

3.102 The migration scenarios illustrate that migration reduces upward pressure on debt over our 50-year projection period. Inward migrants are assumed to be more concentrated among those of working age than the population in general, therefore reducing the dependency ratio slightly. We discussed the impact of net migration on our long-term projections – and the simplifying assumptions on which that impact is based – in detail in Annex A of our 2013 *FSR* and Box 3.4 of the 2014 *FSR*. For example, we assume that, on average, migrants have the same age- and gender-specific labour market participation rates and productivity as the native population. No doubt that assumption would not hold for all migrants – labour market characteristics of migrants from different countries can differ substantially – but it is likely to provide a reasonable guide to the aggregate effects of net migration in our long-term projections.

3.103 Our central projection assumes long-term average net inward migration of 165,000 a year. If net inward migration was in line with the ONS high migration scenario at 225,000 a year – more in line with the average flows seen over the past decade – then we estimate that this would reduce the primary budget deficit by 0.5 per cent of GDP and net debt by 17 per cent of GDP by 2064-65, relative to our central projection. If instead net inward migration was in line with the low migration scenario at 105,000 a year – our central assumption in last year's report – the primary budget deficit would increase by 0.5 per cent of GDP and net debt by 20 per cent of GDP by 2064-65, relative to our central projection.

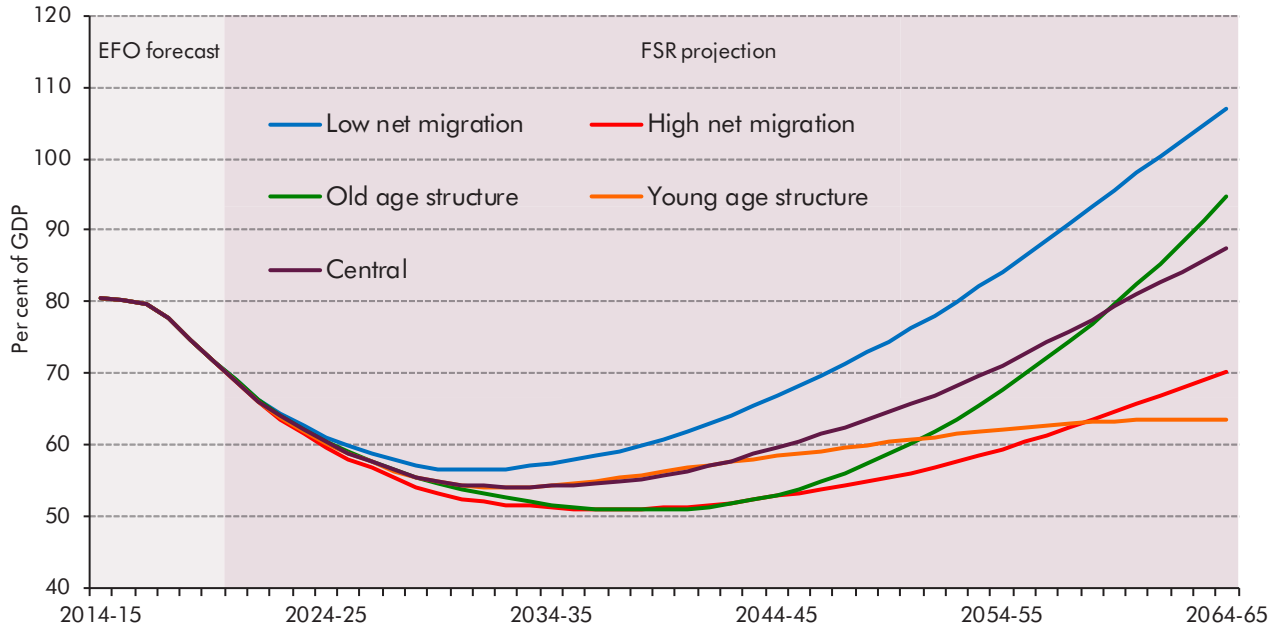
3.104 These scenarios should not be construed as an argument that the Government needs to pursue a particular policy towards immigration in order to achieve (or avoid) a particular outcome for the public finances. Governments doubtless choose their policies towards immigration for a whole variety of social and economic reasons and they could choose to offset their direct fiscal impact with tax and spending policy decisions.

Table 3.14: Non-interest receipts and spending for demographic variants

	Difference from central projection, per cent of GDP						
	Estimate[1]		FSR projection				
	2014-15	2019-20	2024-25	2034-35	2044-45	2054-55	2064-65
Old age structure							
Receipts	0.0	0.0	-0.1	-0.5	-0.8	-1.0	-1.1
Spending	0.0	0.0	-0.1	-1.1	-1.0	-0.4	0.3
Young age structure							
Receipts	0.0	0.0	0.0	0.0	-0.1	0.1	0.2
Spending	0.0	0.0	0.1	0.1	-0.6	-1.0	-1.4
High migration							
Receipts	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spending	0.0	0.0	-0.1	-0.2	-0.4	-0.5	-0.5
Low migration							
Receipts	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Spending	0.0	0.0	0.1	0.2	0.4	0.6	0.6

[1] Estimates are consistent with the March 2015 *Economic and fiscal outlook*.

Chart 3.17: Sensitivity of net debt projections to demographic variants



Source: OBR

Sensitivity to alternative health sector productivity

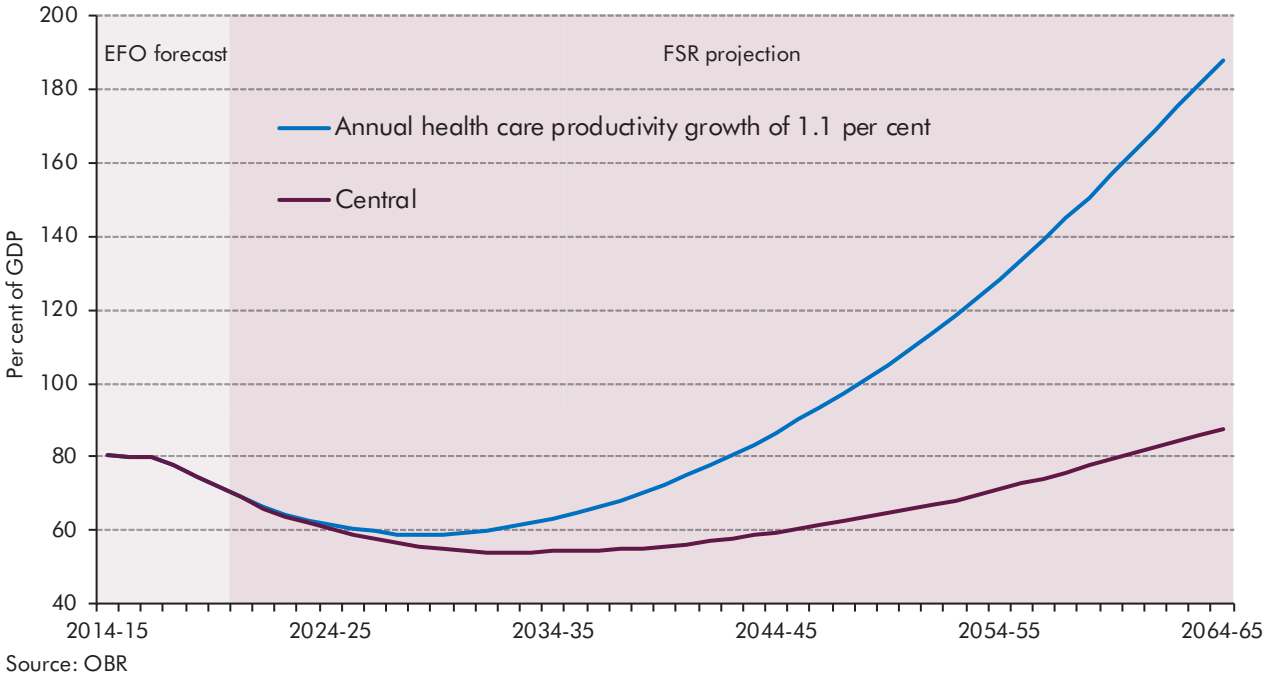
3.105 Spending on health is the largest component of age-related spending in our projections. Given its importance, in past reports we have shown a number of alternative scenarios using different assumptions about productivity growth in the health sector and about morbidity. We discussed these in Annex B of our 2012 *FSR* and provide an update in Box 3.3. The effect of alternative morbidity scenarios on health spending is significantly smaller than the impact of alternative productivity assumptions. As set out above, our results are

also sensitive to the assumption we make about the level of health spending in 2019-20, the starting point for the projections.

3.106 If health sector productivity was assumed to rise at 2.2 per cent a year – in line with our long-term assumption for whole economy productivity – then in our central projections the level of service provided per person would implicitly rise at the same rate as output in the rest of the economy. But health care provision is relatively labour intensive and we might therefore expect productivity growth to be slower in this sector than in the economy as a whole. Yet over the long term, wages in the sector would still need to rise in line with those in the whole economy. This would lead to what is known as 'Baumol cost disease' where costs in the public sector rise relative to other sectors.[5] To maintain an increase in the level of service provided in line with increases in real output across the rest of the economy, governments would have to increase expenditure more quickly.

3.107 Measuring productivity in the health care sector is not a straightforward exercise. But available estimates suggest that productivity in the sector has risen by about 1.1 per cent a year on average between 1979 and 2012. Rolling this forward would imply that real health spending per person would need to rise by 3.3 per cent a year to increase health output by 2.2 per cent a year, in line with real earnings growth. Interpreting unchanged policy towards health spending in this way would see health spending in 2064-65 around 5.0 per cent of GDP higher than in to our central projection and would imply a much higher path for net debt over the projection period, as shown in Chart 3.18.

Chart 3.18: Sensitivity of net debt projections to lower productivity in the health care sector



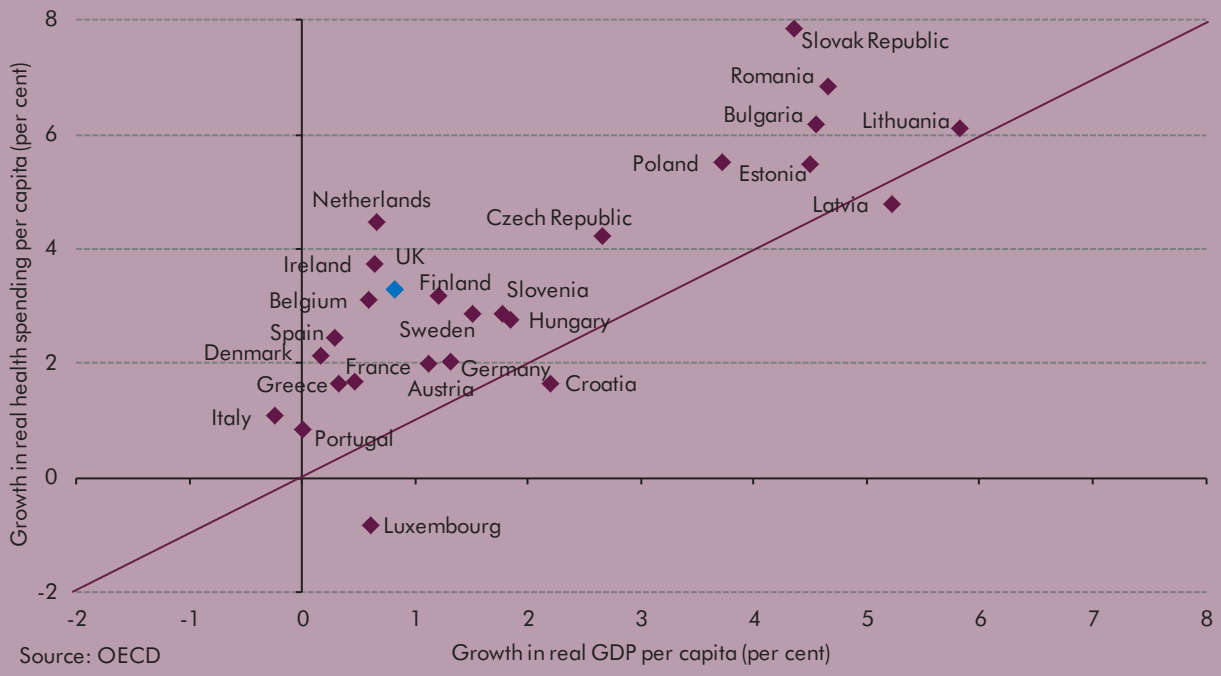
Source: OBR

[5] See Baumol and Bowen (1966).

Box 3.3: Drivers of rising health spending

Health spending has risen faster than GDP in almost all European countries over the past decade (almost all dots are above the diagonal line in Chart C). Our central long-term projections show that trend continuing in the UK, with health spending expected to be the largest source of age-related pressure on the public finances. The sensitivity analysis we present shows that assumptions about what drives changes in health spending as a share of GDP – which we capture by varying our assumption about relative productivity growth in the health sector – are incredibly important. In Annex B of our 2012 *FSR*, we reviewed a number of sensitivities around our central health spending projection. This box provides an update on that analysis, drawing on a number of reports published over the past three years.

Chart C: Growth of real health spending and GDP per capita (2000 to 2012)



Source: OECD

The academic literature identifies three main long-term drivers of real spending on health care:

- **demographic factors**: the effect of the changing age structure of the population, survivor status and death-related costs. We capture these effects in our central projections. Implicitly, we assume that healthy life expectancy rises proportionately with total life expectancy. An alternative assumption would be to assume that more of the additional years of life are spent in better health;
- **income effects**: the fact that health care is a 'normal good', meaning people demand more as incomes rise. This drives real spending, but only affects spending as a share of GDP if the income elasticity is greater or less than one. Our central projections are consistent with an income elasticity of one; and
- **other residual factors**: non-demographic factors such as technological advances, relative price/productivity effects and policy or lifestyle changes. Our sensitivity analysis for the effects of lower health sector productivity captures a key residual factor that may push up

health spending in future.

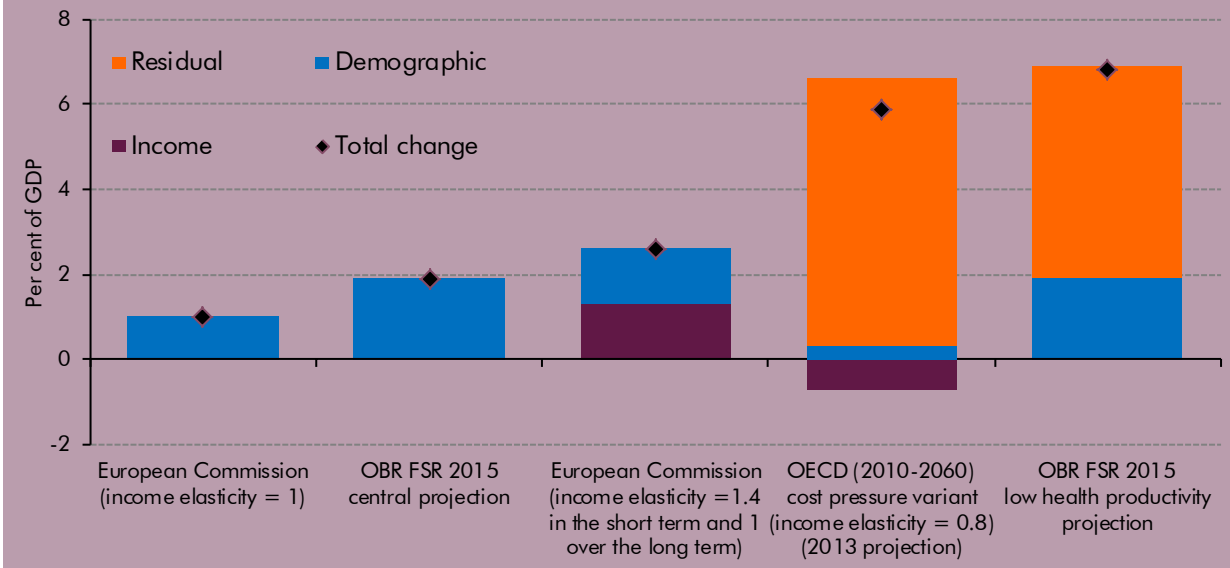
Studies of past trends in health spending show that the income effect is the biggest driver of real terms increases – though with an estimated elasticity typically close to one, this does not account for the rising share of GDP devoted to health spending. Demographic effects have explained little of the past change, although they are expected to account for much more in the future as populations age. As such, it has been residual factors that have largely explained the past rise in health spending as a share of GDP.[a]

In 2013, the OECD published long-term health spending projections that incorporated estimates of residual excess cost growth explicitly. It presented two scenarios: a 'cost pressure' scenario, in which excess cost growth was set at 1.7 per cent a year (based on an econometric estimate of the impact of technology, relative prices and other factors on health care spending) and a 'cost containment' scenario, in which that growth rate was assumed to drop to zero over time (on the assumption that policymakers will be able to address these pressures).[b] Our lower health productivity scenario assumes excess cost growth of 1.1 per cent a year, so the higher residual projected by the OECD suggests other factors have also been at play.

Technological advancements are potentially one such additional driver of excess cost growth. Unlike most industries, technological innovations are generally cost-escalating rather than cost-containing. For example, the Commission's 2015 *Ageing Report* quotes estimates that attribute from around a quarter to around three quarters of health expenditure growth in the industrialised countries to technological change. Such advancements can also increase patient demand, without, in most cases, reducing labour input. For example, new technologies will increase costs if they treat conditions for which there was previously no, or no effective, treatment. Even if an advance lowers the unit cost of treatment, spending can increase if that treatment becomes more widely used, addressing previously unmet demand. Morbidity associated with chronic conditions is also likely to pose an increasing fiscal burden, both due to ageing but also to changing lifestyles. Given the importance of trends in health spending for fiscal sustainability, these are issues we will return to in greater depth again in the future.

There is no consensus over the contribution of demographic, income and residual factors among the drivers of health care spending over the long term (Chart D), but estimates that include a residual component for the effects of low productivity or the impact of technology developments tend be larger than those that focus only on demographic and income-related factors.

Chart D: Long-term projections of changes in health care spending (2020 to 2060)



The demographic components in the European Commission and OECD projections include an assumption of compression of morbidity and are therefore not entirely comparable with OBR scenarios that are purely demographically driven.

Source: European Commission, OECD, OBR

[a] See for example, European Commission (2013 and 2015) and OECD (2013).
[b] See also Soto *et al* (2012) and De La Maisonneuve and Oliveira Martins (2006). The IMF estimated an excess of 1.2 per cent a year over the 1980-2008 period, with considerable variation across countries. The 2006 OECD estimate was an excess of 1 per cent a year over 1980-2005.

Conclusion

3.108 The long-term projections in this chapter are highly uncertain and the results we present here should be seen as illustrative projections, not precise forecasts. We have quantified some of the uncertainties through sensitivity analyses.

3.109 As with our projections in previous *FSRs*, these uncertainties should not be used to disguise the fact that the public finances are projected to come under pressure over coming decades, primarily as a result of an ageing population. Under our definition of unchanged policy, the Government would end up having to spend more as a share of national income on age-related items such as health, pensions and long-term care. But the same demographic trends would leave government revenue roughly stable as a share of national income. We highlight once again that productivity growth in the health sector – and the way in which governments choose to respond to it – will also be a key factor in the future sustainability of the public finances.

3.110 In the absence of offsetting tax increases or spending cuts, the pressure we have identified would eventually increase the budget deficit sufficiently to put public sector net debt on an unsustainable upward path. As discussed in previous *FSRs*, such a path could lead to lower long-term economic growth and higher interest rates, worsening the fiscal position further. These overall conclusions are very similar to last year's, since there have been only small changes to the projections of net debt over the coming decades and the primary balance at

the end of the projection period. The UK is far from unique in facing such pressures, as emphasised in the European Commission's 2015 *Ageing Report*.

3.111 The analysis in this chapter does not tell us the size or timing of the policy adjustment needed to put the public finances back on a sustainable path in the face of these pressures. For that we need to look at some more formal indicators of fiscal sustainability, which is the subject of Chapter 5. Before that, in Chapter 4 we update our analysis of long-term prospects for revenue from the North Sea, where revenues have declined significantly in recent years and the policy regime has been made more generous since our last report.

4 The sustainability of North Sea oil and gas revenues

Introduction

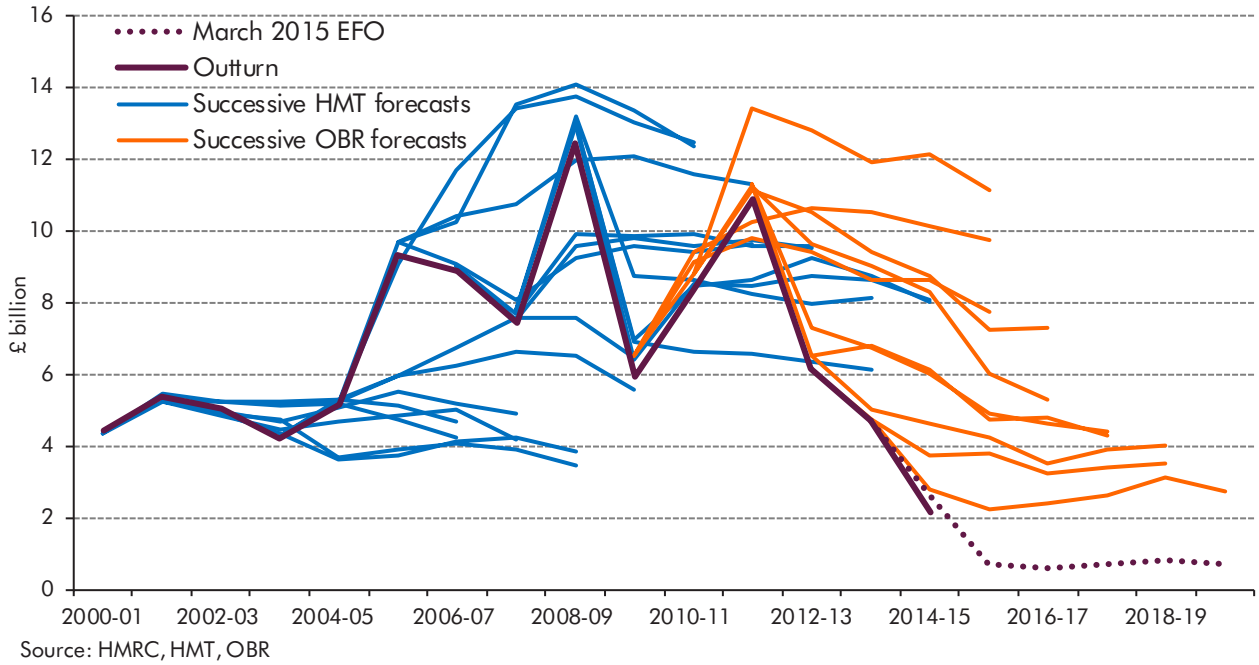
4.1 Prospects for North Sea oil and gas receipts continue to be an issue of considerable interest following the large fall in oil prices seen in the second half of 2014 and the significant policy changes announced in Budget 2015. In this chapter, we consider a range of scenarios, illustrating both the broad trends that might be expected and the significant uncertainty that surrounds any such projections. All our scenarios show a long-term decline in this revenue stream as a result of the gradual exhaustion of the natural resources remaining within the UK continental shelf. But new resources, such as shale gas, could provide new sources of revenue.

4.2 Receipts from oil and gas production are one of the most volatile streams of revenue coming into the Exchequer and therefore one of the most difficult areas of the public finances to forecast. This reflects the number and nature of the factors that determine these revenues – the levels of oil and gas production, the global dollar oil price, the sterling/dollar exchange rate, the level of capital and operating expenditure in the industry, policy changes and the likelihood that individual firms will pay tax on newly generated profits given their past history of profits and losses. Most of these determinants are very difficult to predict in their own right, even over a very short time horizon.

4.3 Box 4.4 in our December 2014 *Economic and fiscal outlook (EFO)* highlighted this volatility and detailed the rise and fall of oil and gas revenues over the last 40 years. Rising production and big increases in oil prices led to receipts reaching a peak of 3.4 per cent of GDP in 1984-85. Receipts then fell sharply, before rising to a more recent but lower peak of 0.7 per cent of GDP in 2011-12. Subsequently receipts have again fallen sharply, to just over 0.1 per cent of GDP in 2014-15. This has largely been driven by falling production and by increasing levels of investment (which can be offset against taxable profits and thus reduce the effective tax rate).

4.4 Chart 4.1 shows the path of oil and gas receipts since 2000 and the successive official forecasts that have been published over that period. The chart highlights the volatility of this revenue stream itself. The average absolute percentage change in oil and gas revenues from one year to the next over the period shown here has been around 34 per cent – compared with just 4 per cent for income tax or 6 per cent for VAT. In recent years, this volatility has primarily reflected fluctuations in production and expenditure and the effect of policy changes. Earlier in the period, oil price movements explained more of the volatility.

Chart 4.1: Oil and gas receipts: outturns and forecasts



Source: HMRC, HMT, OBR

4.5 Outturn oil and gas revenues have been lower than forecast more often than they have been higher over the whole period, but the average error (a measure of forecast bias) is relatively small. This small average error reflects large errors in both directions, with the average absolute error (a measure of forecast accuracy) more than 40 per cent at horizons of two years and beyond. The OBR's forecast errors have been slightly larger than the Treasury's errors were on average and have almost entirely been in one direction, with outturns lower than forecast in all but one year of one Budget forecast. Receipts increased by less than we expected in 2010-11 and 2011-12 and have fallen by 80 per cent in the subsequent three years. Indeed, the £2.1 billion raised in 2014-15 was less than had been predicted in all thirteen forecasts that had included a forecast for that year.

The medium-term forecast

4.6 The starting point for our long-term oil and gas revenue projections is our March 2015 *EFO* forecast, where we expected receipts to fall from £2.6 billion in 2014-15 to £0.7 billion in 2019-20. This compares with a recent peak of just under £11 billion in 2011-12.

4.7 Our medium-term forecast assumes that:

- prices follow those implied by the oil and gas price futures markets for the first two years of the forecast period, then remain constant in nominal terms for the remaining three years;
- exchange rates follow a path consistent with the uncovered interest parity condition, which relates exchange rate movements to interest rate differentials;

- production falls gradually over the forecast period, informed by Department of Energy and Climate Change (DECC) – now the Oil and Gas Authority (OGA) – estimates;[1] and

- capital and operating expenditure are also informed by DECC projections.

4.8 Table 4.1 shows the changes in the main determinants of our medium-term forecast since last year's *FSR*. The forecast for dollar oil prices is significantly lower over the whole period. This largely reflects the sharp fall in oil prices seen in the second half of 2014, explained in more detail in Box 2.1 of our March *EFO*. Gas prices have also fallen significantly since last year's *FSR*. Our projections for oil and gas production are significantly lower over the medium term, as reductions in the oil price mean that some new fields and projects will no longer be viable. Operating and capital expenditure are also projected to be much lower, as lower oil and gas prices reduce the net present value of potential capital projects as well as putting downward pressure on expenditure and investment costs.

Table 4.1: Changes in the medium-term determinants

	2013	2014	2015	2016	2017	2018
March 2014 *EFO*						
Oil prices ($ per barrel)	108.8	107.5	102.0	99.3	99.3	99.3
Oil prices (£ per barrel)	69.6	64.7	61.1	59.2	59.0	59.1
Gas prices (p/therm)	66.9	60.2	63.2	63.2	63.2	63.2
Oil production (million tonnes)	40.6	39.2	39.2	39.2	39.2	39.2
Gas production (billion therms)	12.8	12.8	12.7	12.7	12.7	12.7
March 2015 *EFO*						
Oil prices ($ per barrel)	108.8	98.9	62.1	69.2	71.4	71.4
Oil prices (£ per barrel)	69.6	60.0	40.3	44.9	46.1	45.9
Gas prices (p/therm)	66.9	50.2	47.8	50.3	50.3	50.3
Oil production (million tonnes)	40.6	39.7	38.3	36.7	34.9	33.4
Gas production (billion therms)	12.8	13.1	12.6	11.9	11.4	10.9
Percentage change						
Oil prices ($ per barrel)		-8.0	-39.1	-30.3	-28.1	-28.0
Oil prices (£ per barrel)		-7.2	-34.0	-24.2	-21.8	-22.3
Gas prices (p/therm)		-16.7	-24.4	-20.4	-20.4	-20.4
Oil production (million tonnes)		1.3	-2.3	-6.4	-11.0	-14.8
Gas production (billion therms)		2.3	-0.8	-6.1	-10.2	-13.9

All prices in nominal terms. Determinants are on a calendar year basis, but relate to receipts in the corresponding financial year (i.e. 2013-14 receipts relate to determinants in 2013).

Oil and gas prices

4.9 Changes in global oil prices are particularly difficult to forecast. This reflects the number and nature of the determinants of those prices, which include: activity in the global economy, global oil production levels, the extent of inventories and spare capacity,

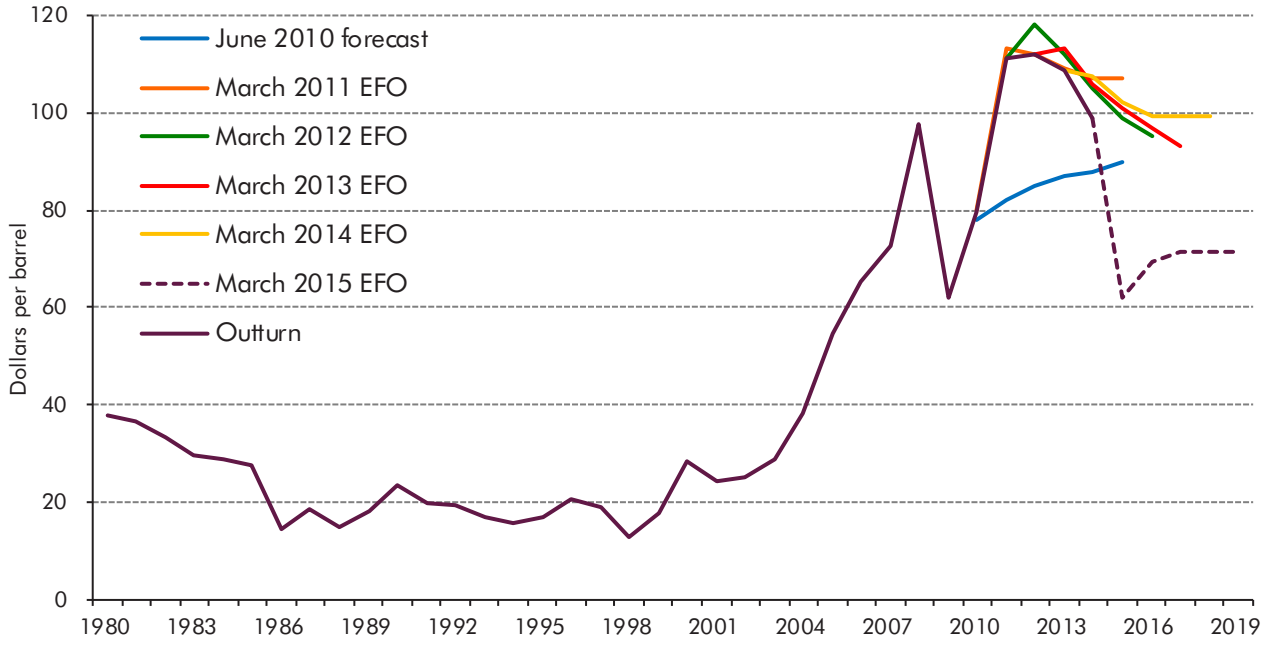
[1] Department of Energy and Climate Change (2015).

geopolitical events and speculative demand – all of which are difficult to predict with any accuracy, even over very short time horizons.[2]

4.10 We assume that oil and gas prices move in line with their futures curves for the first two years and are constant thereafter. As the International Monetary Fund has noted: "*futures price based forecasts are hard to beat*" over a two year horizon, but "*the relative forecasting ability of futures prices deteriorates the longer the forecast horizon, which likely reflects lower liquidity at the back end of futures curves*".[3]

4.11 Chart 4.2 shows the dated Brent dollar oil price since 1980 (using IMF data) against our Budget assumptions since June 2010. Since March 2011, our oil price assumptions have been too high with the dollar oil price falling more than expected in 2013 and 2014. The sharp fall in our forecast for 2015 largely reflects actual price movements in the early part of the year, the majority of which fed through to the futures curve for the rest of the year.

Chart 4.2: Oil price forecasts and outturns



Source: IMF, OBR

Oil and gas production

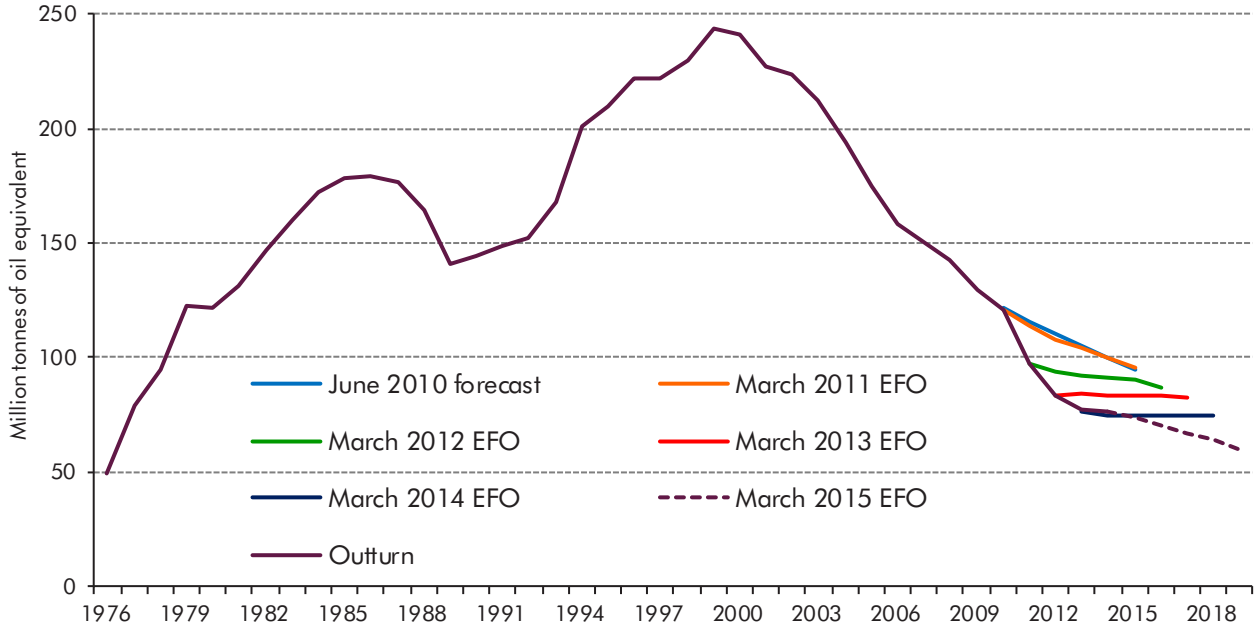
4.12 North Sea oil and gas production has fallen each year since 2000, by 7.8 per cent a year on average. The rate of decline eased last year, with a fall of just 0.9 per cent. Our central forecast is for production to decline more gradually than the long-term trend between 2014 and 2019, reflecting the expected returns from high levels of investment in recent years.

4.13 As set out above, we make use of DECC oil and gas production projections to inform our medium-term forecast. These are informed by confidential field-level data provided to

[2] For discussion of the challenge of forecasting oil prices, see for example Reichsfeld and Roache (2011) and Nixon and Smith (2012).
[3] Reichsfeld and Roache (2011).

DECC by the operators of each field. Estimates provided by the industry are adjusted, based on DECC judgements on production levels, for example to take account of project slippage. DECC also adjust for past optimism in industry forecasts. While the DECC production forecasts that we use are consistently lower than industry predictions, they have still tended to be overoptimistic, as Chart 4.3 shows.

Chart 4.3: Production forecasts and outturns



Source: DECC, OBR

Medium-term North Sea revenue forecast

4.14 Our starting point for the long-term revenue projections is the March 2015 *EFO* forecast. Table 4.2 shows the key drivers behind the changes since our March 2014 forecast, which provided the starting point for last year's *FSR*. Our forecasts are significantly lower, reflecting much lower oil and gas prices, lower production, modelling changes and the Autumn Statement and Budget policy measures. These were partly offset by lower expenditure, which boosts receipts.

Table 4.2: Key changes to the medium-term oil and gas revenues forecast since March 2014

	£ billion				
	2014-15	2015-16	2016-17	2017-18	2018-19
March 2014	3.7	3.8	3.2	3.4	3.5
March 2015	2.6	0.7	0.6	0.7	0.8
Change	**-1.1**	**-3.1**	**-2.6**	**-2.7**	**-2.7**
of which:					
Sterling oil prices	-0.5	-1.8	-1.3	-1.0	-1.1
Gas prices	-0.6	-0.7	-0.6	-0.6	-0.6
Production	0.1	-0.2	-0.5	-1.1	-1.6
Expenditure	0.1	0.6	0.9	1.2	1.9
Modelling and outturn receipts	-0.2	-0.8	-0.6	-0.8	-1.0
Measures	0.0	-0.3	-0.5	-0.4	-0.4

Long-term projections

4.15 Our long-term projections are based on the same methodology as in previous years. We commission HMRC to run its oil and gas revenue model to extend the medium-term forecast to 2040-41. The model estimates revenues at an individual field level, based on data provided by operators. For the long-term projections, the data are augmented to allow for extra production from new incremental projects in existing fields, development of technical reserves and new exploration, in order to meet the stylised production profile.

4.16 As with our medium-term forecasts, these projections are based on a number of highly uncertain assumptions. Alongside the uncertainties surrounding the determinants of the projections – as discussed above – the augmentation of the model data to meet the stylised production and expenditure profiles adds a further source of uncertainty. The revenue projections are very dependent on the tax-paying positions of the companies with shares in the fields to which new production and expenditure are allocated. Added to this, it is clearly possible that the industry's response to the conditions as set out in our projections could lead to different outcomes than those set out below.

4.17 Beyond the medium-term forecast, from 2020 onwards, we assume that:

- nominal oil and gas prices rise in line with our long-term assumption for whole economy inflation (2.3 per cent a year);
- production falls by 5 per cent a year, which is significantly slower than the 7.8 per cent a year average fall since 2000;
- real operating and capital expenditure move in line with production. In the first two years of the projection, we assume that nominal capital expenditure falls in line with the average decline in 2018 and 2019, to reflect the impact of lower oil prices on investment; and

- decommissioning expenditure is informed by operator reports and is scaled to reflect recent movements in the oil price. We have also smoothed the profile of decommissioning expenditure to reduce some of the year-to-year volatility, as this would imply a spurious degree of accuracy in individual years of the projection.

4.18 The supplementary tables on our website include the full underlying series for each of these assumptions to 2040-41.

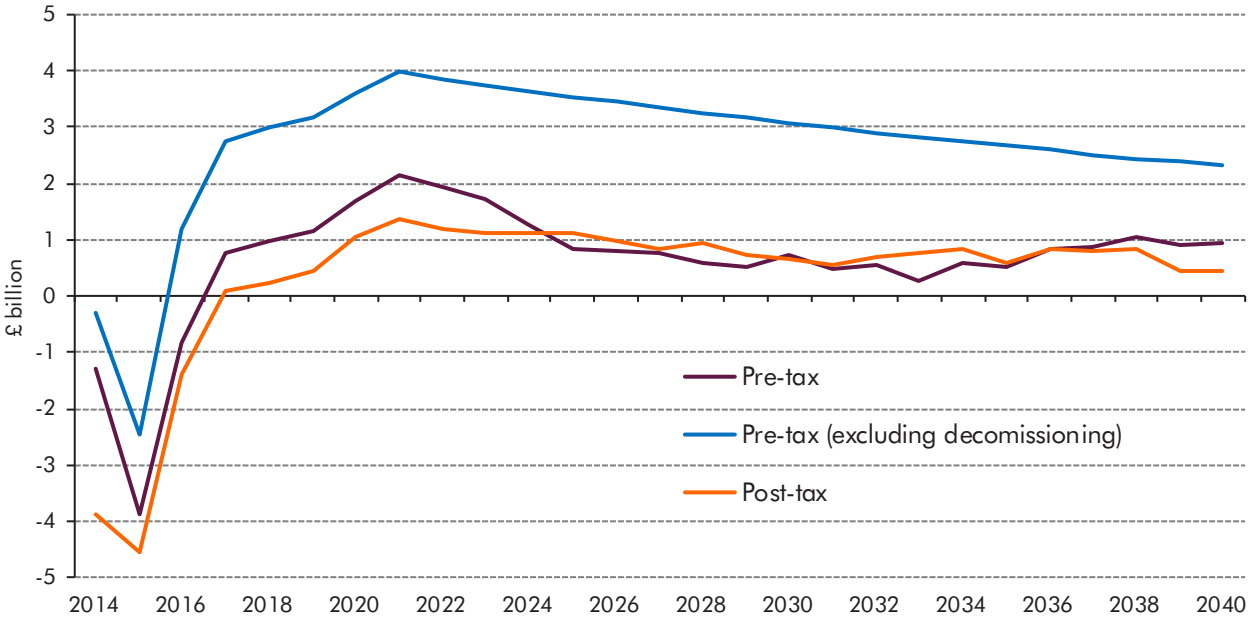
4.19 As in previous reports, we have not included any effect on receipts from the potential development of the UK's shale gas resources. As discussed in our 2014 *FSR,* recent work from the British Geological Survey and DECC has quantified possible shale oil in place in the Jurassic Weald Basin and shale gas in place in the Bowland-Hodder Shale Basin, but reliable estimates of the amount of recoverable resources are not yet available.[4,5] The timing of any potential commercial extraction is also too uncertain at this point to quantify with any confidence. Overall, shale gas production represents potentially large upside risks for the Exchequer. But risks may not all be in the same direction: potential downside risks include lower gas prices as a result of increased supply, which would have a knock-on effect to North Sea producers. Our projections for gas prices are not explicitly adjusted for any effect of increased supply from shale gas extraction.

4.20 Our projections for prices, production and expenditure imply a stylised profile for North Sea companies' total profits before tax shown in Chart 4.4. Given that production in some fields may receive a premium or discount relative to the Brent price assumption, these profiles are illustrative.

4.21 Overall, this implied measure of pre-tax profits has been revised down in both our medium-term forecast and long-term projections as lower gross sales (due to lower prices and production) are only partially offset by lower expenditure. Decommissioning costs can be offset against past profits chargeable to ring-fence corporation tax (CT) and historic petroleum revenue tax (PRT) payments, so we also show implied pre-tax profits excluding these costs. The final line shows implied post-tax profits, which represent a proxy for overall cash flow of the industry. Low oil prices and relatively high levels of expenditure mean that post-tax profits are expected to be negative from 2014 to 2016. As expenditure falls over the next few years, post-tax profits return to a positive position from 2017 onwards.

[4] British Geological Survey and Department of Energy and Climate Change (2013).
[5] British Geological Survey and Department of Energy and Climate Change (2014).

Chart 4.4: Implied pre- and post-tax profits from North Sea production



Source: OBR

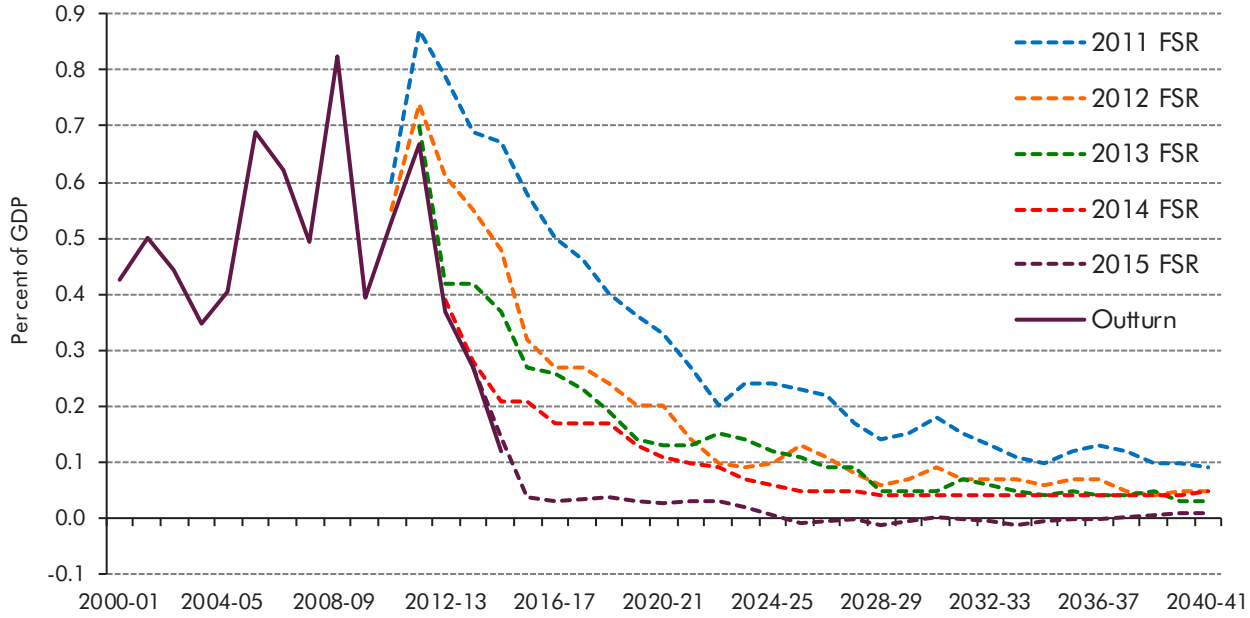
4.22 Chart 4.5 shows our long-term projections for North Sea revenues, which have been revised lower since last year – and are close to or below zero in many years. Revenues are expected average just 0.004 per cent of GDP between 2020-21 and 2040-41, a fraction of the already low level recorded in 2014-15. PRT receipts remain negative from 2024-25 onwards, as repayments associated with decommissioning costs outweigh payments. Expected revenues over this period total £2.1 billion, down £34.5 billion from our estimate last year. Of this downward revision:

- around £15 billion reflects the combined effect of lower sterling oil and gas prices, which directly reduce the profits of oil and gas firms, and therefore receipts;
- around £13 billion reflects a downward revision to expected production. As discussed above, lower oil and gas prices mean that some new fields and projects will no longer be viable. This knocks through to the long-term projections;
- as discussed in our March *EFO*, the large changes to North Sea prices, production and revenues – and the policy measures announced in Budget 2015 – required even greater scrutiny of the outputs of the oil and gas model. That uncovered issues that required a number of corrections and updates to the model that have reduced our projections by around £11 billion over the 21 years of the projection period;
- around £14 billion of the overall decline in receipts reflects the static effect of policy measures announced at Autumn Statement 2014 and Budget 2015, which include: a cut in the supplementary charge from 32 per cent to 30 and then to 20 per cent, a cut the rate of PRT by 15 per cent and the implementation of new investment and field

allowances. (The behavioural effects from these policy changes are accounted for within the overall production and expenditure effects on receipts); and

- these downward revisions are offset by around £17 billion in additional receipts due to lower expected expenditure, which is tax deductible. This reflects the fact we have revised down the expenditure projections in our medium-term forecast (which knocks through to the long term).

Chart 4.5: Long-term projections of oil and gas receipts



Source: HMRC, ONS, OBR

4.23 The North Sea tax regime allows companies to offset trading losses against taxable profits. Indeed, the rules for carrying back past losses are more generous for offshore CT than for onshore CT. Terminal losses (i.e. those occurring when trade is ceased) and losses arising from the decommissioning of infrastructure can be offset against taxable profits within the last three years (if the losses were incurred before March 2008) or to 2002 (if the losses were incurred after March 2008). As with onshore CT, trading losses can also be carried forward and used against taxable profits. In the case of PRT, losses arising from the decommissioning of infrastructure can be offset against any taxable profits made during the life of the field. (Over the past 37 years, around £64 billion of PRT has been paid in total, giving an indication of the scope for repayments in the future.)

4.24 In its 2013-14 trust statement, HMRC included a provision of £3.1 billion for the taxes that it expects to be lost due to the costs of oil and gas field decommissioning over the five years to 2018-19. HMRC has not included any provisions or quantified contingent liabilities for the remaining potential losses in periods after that, because it considers them to be too uncertain. (In Chapter 2, these can be seen in the context of other major HMRC and wider Government provisions and contingent liabilities.)

4.25 Our *EFO* forecast implies that pre-tax profits will be negative from 2014 to 2016, adding to the stock of losses built up within the industry. Offshore CT receipts remain low throughout the projection as this stock of losses offsets a large proportion of the profits associated with new production. PRT receipts (net of repayments) remain negative for the majority of the period, as current PRT payments are more than offset by the repayments associated with losses being offset against payments in previous years.

4.26 Changes in the tax position of individual companies can cause large movements in the projections, particularly the profile of losses available to offset taxable profits made in the future. These changes are reflected in our projections through HMRC's forecasting model, but we do not have access to the fully disaggregated taxpayer-confidential information HMRC collects. So we cannot fully disaggregate the changes described here.

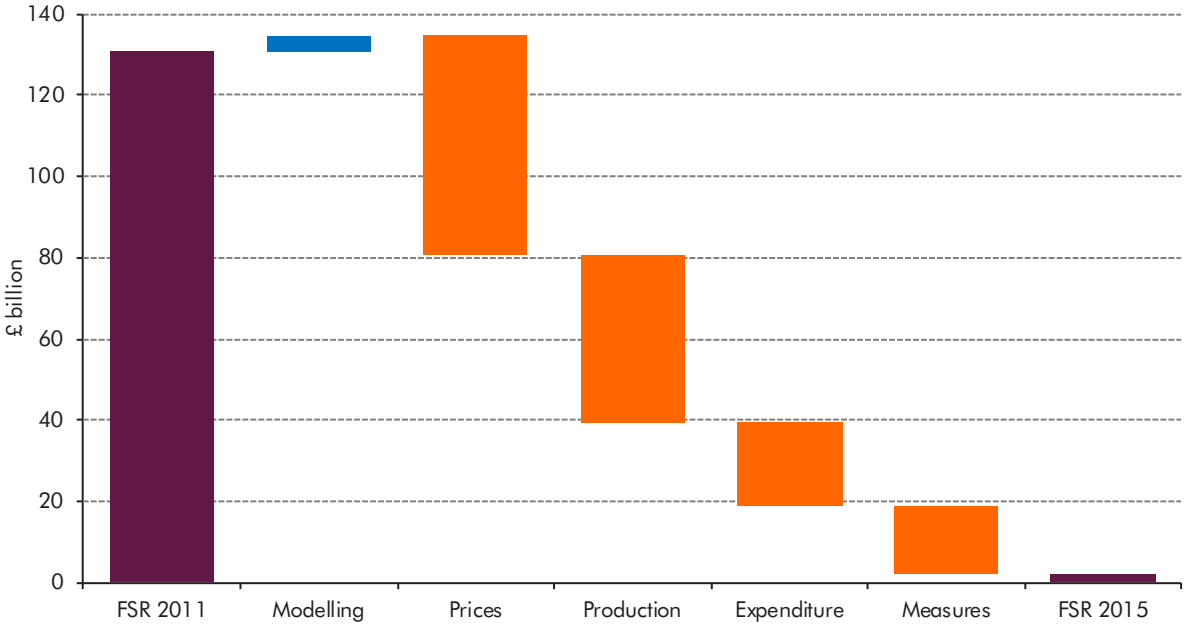
Changes since our first *FSR* projections in 2011

4.27 Our projections for North Sea revenues have been revised down in each of our *FSRs*. Cumulative receipts between 2020-21 and 2040-41 are now around £129 billion lower than our first *FSR* projection in 2011. Chart 4.5 decomposes the factors contributing to this large downward revision. It shows that:

- around £54 billion is due to downward revisions to projected oil and gas prices, reflecting a much lower starting point. Our central projection for the oil price in 2040-41 is now around £74 a barrel, down from around £128 a barrel in *FSR* 2011;
- around £41 billion is due to downward revisions to projected oil and gas production. Total production over the period has been revised down by around 23 per cent, reflecting both weak outturn production and the expected impact of much lower oil prices on the development of new fields. (As described below, this implies that a smaller proportion of ultimately recoverable reserves are now projected to be extracted during the projection period);
- around £20 billion is due to expenditure effects. Despite a reduction in capital expenditure of around £42 billion over the whole period, decommissioning expenditure is forecast to be around £14 billion higher and operating expenditure £6 billion higher;
- around £17 billion is due to the static effect of policy measures, the majority of which were announced at Autumn Statement 2014 and Budget 2015; and
- these downward revisions are partially offset by around £4 billion of modelling changes.

4.28 Overall, around three quarters of the downward revision to receipts between our 2011 and 2015 *FSR* projections can be attributed to production and price changes. As has been illustrated in successive medium-term forecasts and long-term projections, these assumptions are highly uncertain.

Chart 4.6: Cumulative revenues between 2020-21 and 2040-41: sources of change



Source: OBR

Scenarios

4.29 Given the large uncertainties inherent in the assumptions that underlie our projections, we show how sensitive they are to different outcomes for prices and production. This year we have combined the price and production scenarios to project revenues under a high price and high production environment and a low price and low production environment.

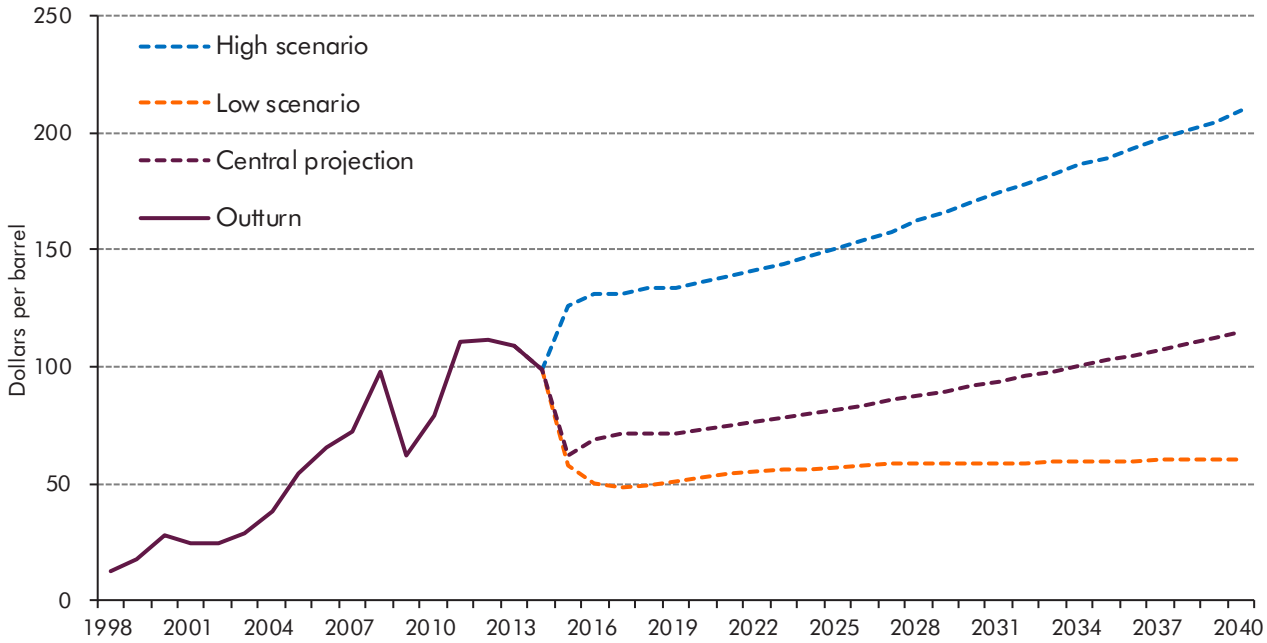
Price scenarios

4.30 Our price scenarios utilise the US Energy Information Administration's (EIA) price projection variants. To maintain consistency with our central projection, we apply the proportional difference between the EIA's scenarios and reference projections to our central projection.

4.31 We also assume that changes in the oil price feed through to operating and capital expenditure costs. As we discussed in *FSR* 2013, unit operating and capital costs have increased on average at around half the rate of oil prices in recent years, with the sharp rise in oil prices in 2008 and 2011 associated with a steep rise in costs. To take account of this effect, we have assumed that only half of the difference in oil and gas prices in our alternative scenarios feeds through into taxable profits and receipts.

4.32 In the high oil price scenario, nominal dollar oil prices rise to around $209 a barrel; in our low oil price scenario, they remain at around $60 a barrel. The price variation in these scenarios is therefore not symmetrical, with the high scenario lying around twice as far above the central projection as the low scenario is below it. Of course, there would be wider economic effects if oil prices reached these levels, which we have not attempted to model.

Chart 4.7: Oil price scenario assumptions

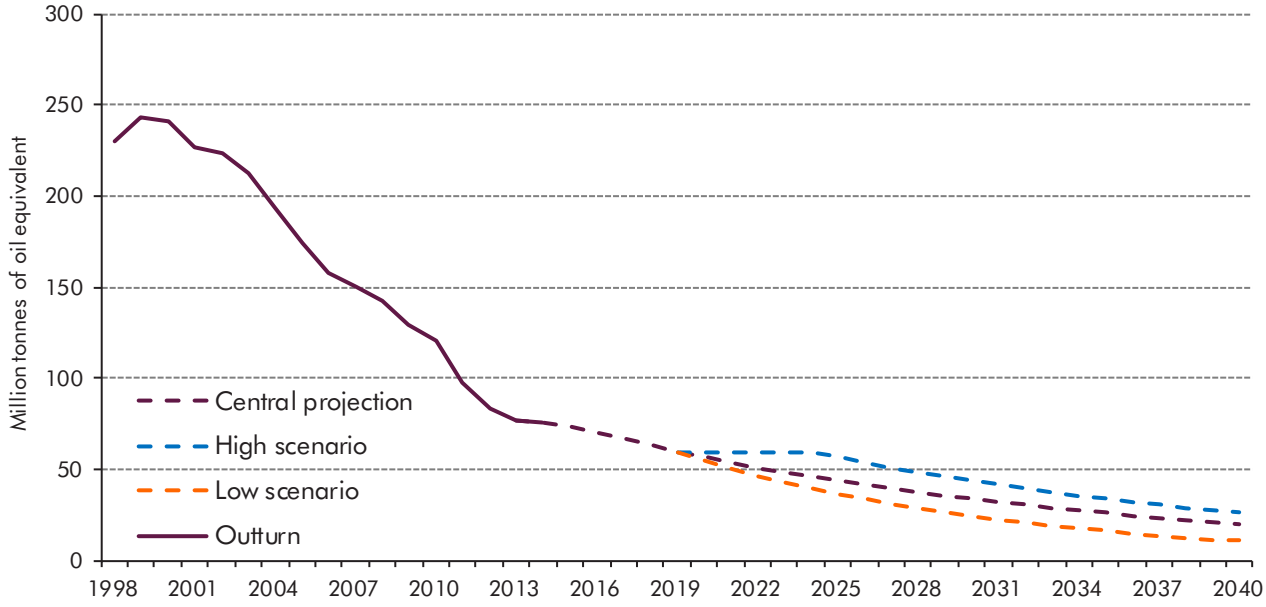


Source: IMF, OBR

Production scenarios

4.33 Production has been declining year-on-year for more than a decade, but recent investment may help to maintain or even increase production over the medium term. Our central long-term assumption is that production falls by 5 per cent a year from 2020 onwards. For our low production scenario we assume a 7.8 per cent a year fall – in line with the average pace of decline since 2000. If recent high levels of investment boost production, we may see current levels maintained over a longer period. Our high production scenario sees production remaining as we expect in 2019 for a further 5 years, with a fall of 5 per cent a year thereafter, in line with the assumption in the central projection.

Chart 4.8: Production scenario assumptions

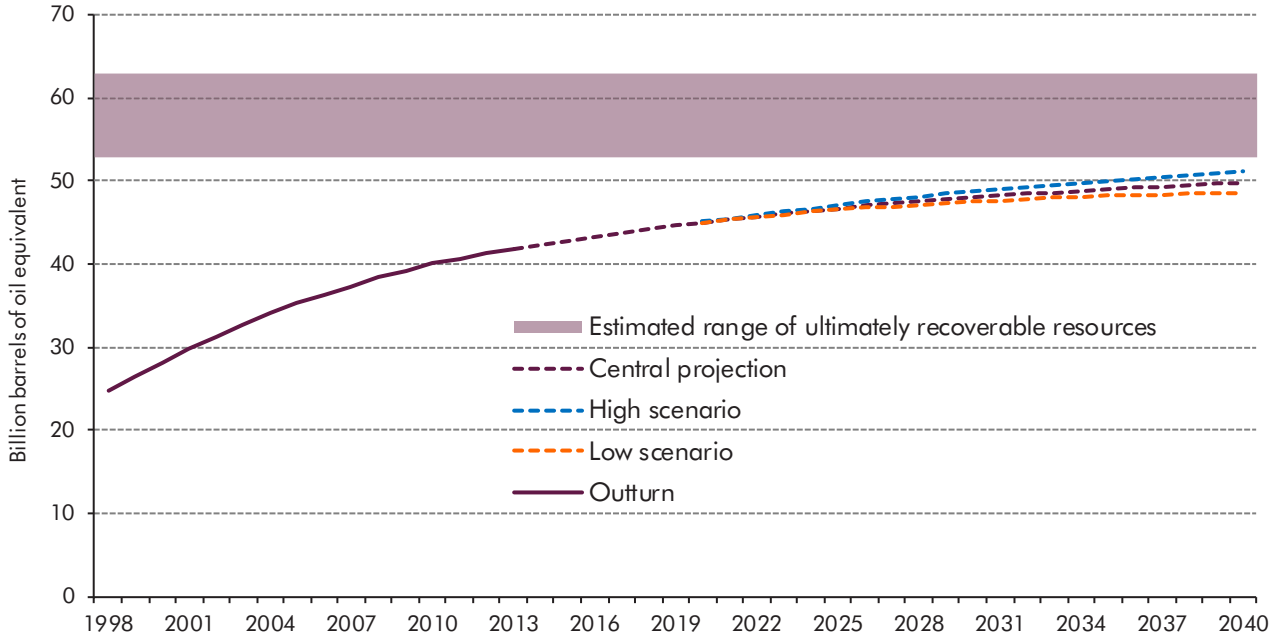


Source: DECC, OBR

4.34 Over the long term, recoverable reserves are clearly on a declining path as the basin matures and resources are exhausted or become increasingly difficult or uneconomic to extract. DECC produces a range of estimates of remaining oil and gas reserves, based on technical and commercial viability under current conditions.

4.35 Chart 4.9 shows the cumulative production forecasts implied by our scenarios against the estimated level of ultimately recoverable reserves produced by DECC as at the end of 2013. In all our scenarios, significant recoverable reserves remain by the end of the projection period. This implies scope for higher production if conditions were sufficiently favourable, or for production to continue for a number of years beyond our projection period.

Chart 4.9: UK oil and gas reserves and production



Source: DECC, OBR

4.36 As shown in Chart 4.10 and Table 4.3, revenues in our high and low scenarios average 0.047 and -0.006 per cent of GDP respectively over the 2020-21 to 2040-41 period, compared to 0.004 per cent of GDP average for the central projection. The low scenario yields around £7 billion less than the central projection over that period – a relatively small difference, partly reflecting the fact that for those firms assumed to be loss-making in the central projection there is no further revenue lost. The high scenario yields around £31 billion more – a larger difference, since in this scenario some loss-making firms would move into profit and become taxpayers.

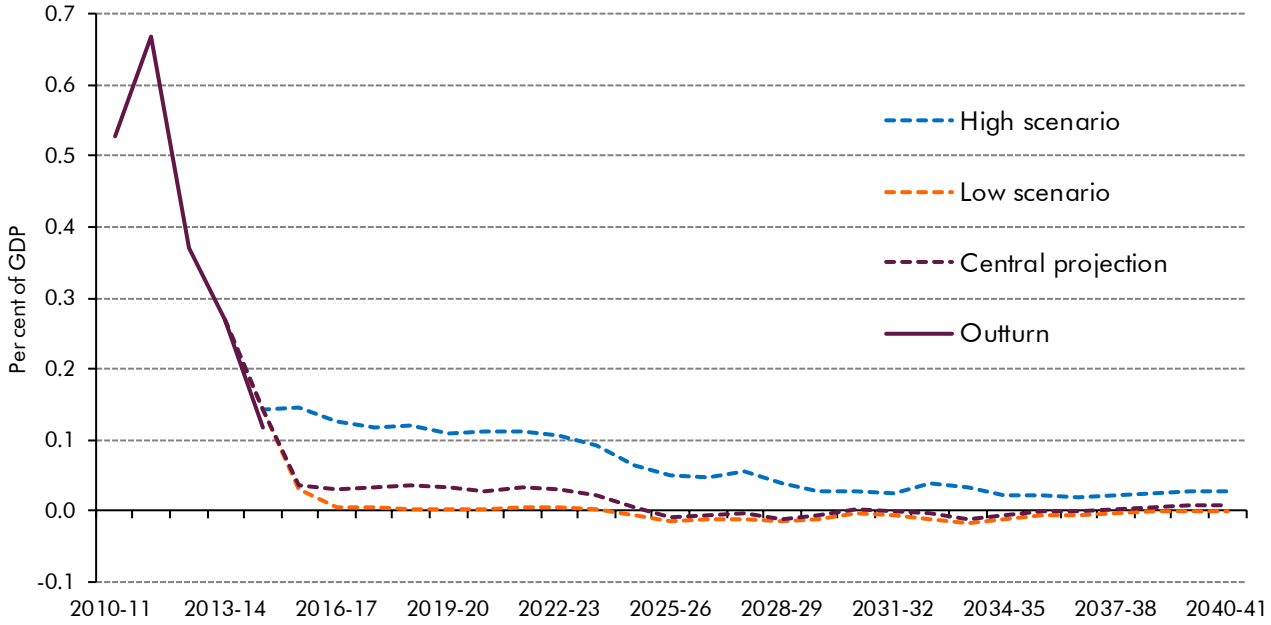
4.37 Our high and low scenarios provide illustrations of the tax consequences for the Exchequer if prices and production follow the paths set out above. In particular, the low projection shows that total revenues from North Sea production (net of repayments) could be negative over the projection period. In this event there might be further real-world responses beyond those that a stylised projection can illustrate.[6] Further behavioural effects, such as firms squeezing costs to boost profits – or exiting the industry – are not modelled here. We present the low projection scenario partly to prompt those further thoughts, rather than to suggest that it is the most likely outcome if oil prices did in fact follow this path.

4.38 Over the 2020-21 to 2040-41 period, this year's high scenario yields around 10 per cent less revenue than last year's central projection, despite prices averaging 41 per cent higher and production totalling 5 per cent more than in that projection. The negative difference is largely due to a lower starting point (implying a higher stock of losses in the starting year),

[6] For example, changes to cost and efficiency improvements have not been modelled in this scenario. A recent press release by Oil & Gas UK (2015) argued that: *"The goal is to achieve a more internationally competitive oil and gas province and attract the fresh investment needed to unlock the North Sea's remaining potential. Achieving this will require a 40 per cent reduction in the industry's cost base."*

plus the effects of modelling changes and the estimated static cost of the Autumn Statement 2014 and Budget 2015 policy measures, all of which have lowered revenues since last year.

Chart 4.10: Oil and gas revenues in the scenarios



Source: ONS, HMRC, OBR

Table 4.3: Projected revenues from alternative scenarios

	Central	Low	High
Total receipts (2020-21 to 2040-41)			
£ billion	2.1	-5.0	33.0
Difference from central projection	-	*-7.0*	*30.9*
Total receipts (average 2020-21 to 2040-41)			
Per cent of GDP	0.004	-0.006	0.047
Difference from central projection	-	*-0.010*	*0.043*

Conclusion

4.39 North Sea revenues are the most volatile revenue stream in the UK public finances and forecasting them over even short horizons is difficult. Our medium-term forecasts have been overoptimistic in recent years, mostly because production has fallen short of expectations.

4.40 Over the longer term, we can be more confident that oil and gas receipts are on a declining trend as production from the UK continental shelf moves towards its ultimately recoverable capacity. But the same factors that make receipts volatile on a year-to-year basis make it very hard to predict the pace of the decline with any confidence. The production and price variants in this chapter give some sense of the uncertainties. But even an assumption of higher production and oil prices reaching around $210 a barrel leaves revenues as a share of GDP at a fraction of the levels seen in the past 10 years. That said, the potential exploitation of shale gas represents a significant – but as yet unquantifiable – upside risk.

5 Summary indicators of fiscal sustainability

Introduction

5.1 In Chapter 3, we set out illustrative long-term projections for UK public spending and revenues, and the implications that these would have for the health of the public finances. On current policies, our central projection shows that public sector net debt and debt interest would eventually rise continuously as a share of GDP, due largely to the prospective ageing of the population.

5.2 This trajectory would clearly be unsustainable, but it would also probably be common to most advanced economies. In this chapter, we discuss two widely used indicators that define the concept of sustainability more rigorously and quantify the scale of tax increases and/or spending cuts that might eventually be required to move the public finances back onto a sustainable path.

Indicators of sustainability

The inter-temporal budget gap

5.3 Most definitions of fiscal sustainability are built on the concept of solvency – the ability of the government to meet its future obligations. In formal terms, this solvency condition is given by the government's inter-temporal budget constraint. Satisfying this condition requires that, over an infinite time horizon, the government raises enough revenue to cover all its non-interest spending and also to service and eventually pay off its outstanding debt. This requirement is normally expressed in stock rather than flow terms, namely that the present value of future government receipts should be equal to or greater than the sum of its existing debt plus the present value of all its future spending.

5.4 In the event that a government is not on course to satisfy the inter-temporal budget constraint, the 'inter-temporal budget gap' is a measure of the immediate and permanent increase in taxes and/or cut in public spending as a share of GDP that would put the government back on course.

5.5 The primary balance required to satisfy the inter-temporal budget constraint depends crucially on the gap between the interest rate that the government has to pay on its debt and the long-run growth rate of the economy. The higher the interest rate, the quicker debt will accumulate; the higher the growth rate, the easier it is to service and pay it off.

5.6 If the interest rate paid on government debt remains below the rate of growth, then net debt would still fall as a share of GDP even if the government were to run a primary budget deficit. Conversely, if the interest rate exceeds the economic growth rate (as it is normally assumed to do) then in the long run the government will need to raise more in revenue than it spends on things other than debt interest (i.e. to run a primary budget surplus) in order to service and pay off the debt it has already accumulated. The greater the amount by which the interest rate exceeds the growth rate, the bigger the primary surplus required.

5.7 In our central projections, we assume that the long-run interest rate is marginally above the long-term growth rate of the economy (5.0 per cent versus 4.8 per cent). This implies that only small permanent primary surpluses are required to stabilise the debt to GDP ratio.

5.8 As the inter-temporal budget gap is calculated from revenue and spending flows over an infinite time horizon, we have to make some assumptions about their behaviour beyond our 50-year projection horizon – for simplicity, we hold them constant as proportions of GDP after 2064-65.

5.9 In the projections we report here, we assume that tax and spending policy evolves as currently announced over the five years of the *EFO* medium-term forecast. So we calculate the inter-temporal budget gap for a policy change implemented immediately thereafter, in 2020-21. On this basis, the UK's inter-temporal budget gap is currently equal to 1.9 per cent of GDP. In other words, under our central projections the government would need to increase taxes and/or cut spending by 1.9 per cent of GDP (£36 billion in today's terms) from 2020-21 onwards to satisfy the inter-temporal budget constraint with an immediate and permanent adjustment. The equivalent figure in last year's *FSR* was 1.7 per cent of GDP. Not coincidentally, these figures are very close to, but fractionally bigger than, the primary deficit at the end of the projection period. Given our assumption that the interest rate on government debt is close to the long-term growth rate, running a relatively small primary surplus into the indefinite future would eventually lead to debt being eliminated.

5.10 The inter-temporal budget constraint has the advantage of theoretical rigour, but it also has limitations as a practical guide to policy. For example, it assumes that governments will eventually wish to eliminate their debt entirely, which relatively few have expressed a desire to do. Revenue and spending projections over 50 years are uncertain enough; projections over an infinite horizon are clearly far more so. The inter-temporal budget constraint might also be thought insufficiently constraining, because rather than being met through an immediate and permanent adjustment, it would allow governments to run large fiscal deficits for extended periods provided there were sufficiently large fiscal surpluses assumed at some point in the potentially far distant future. No government could credibly commit itself and its successors to such a path of long-deferred virtue. As a result, alternative criteria are usually used to judge sustainability, the most common being the 'fiscal gap'.

Fiscal gaps

5.11 Rather than looking over an infinite horizon, as the inter-temporal budget gap does, fiscal gaps are judged over a pre-determined finite horizon. The fiscal gap is the immediate and

permanent change in the primary balance needed to achieve a certain, pre-determined debt to GDP ratio in a specified year.

5.12 One of the main strengths of fiscal gaps is that they are intuitive and can be interpreted easily in the context of some policy rules, such as the Maastricht debt criterion of 60 per cent of GDP. But there is no consensus regarding the optimal debt ratio and how quickly one should aim to return to it if the public finances move off course. It is also important to remember that while a fiscal gap of zero implies that the public finances are sustainable for a given debt target and timetable, this does not necessarily mean that the fiscal policy setting is optimal.

5.13 In the absence of a policy rule that dictates the choice of target year, the aim is normally to pick a date far enough ahead to capture the most significant (typically demographic) future influences on the public finances, but not so far ahead that the projections are subject to any greater uncertainty than necessary.

5.14 Table 5.1 shows fiscal gap calculations for the demographic and health care variants discussed in Chapter 3. As with the inter-temporal budget gap calculation, the primary balance necessary to stabilise debt as a share of GDP depends crucially on the difference between the interest rate and the long-term economic growth rate. We therefore show the gaps not only for our central assumption that the long-run interest rate exceeds the long-term economic growth rate by 0.2 percentage points, but also under alternative assumptions where the difference between the interest rate and the growth rate is 1 percentage point higher or lower.

Table 5.1: Fiscal gap estimates

	Adjustment in primary balance, per cent of GDP			
Target year	2064-65	2064-65	2064-65	2054-55
Target debt to GDP ratio (per cent)	20	40	60	40
Central projection	1.5	1.1	0.6	0.9
Interest rate 1 percentage point higher	1.5	1.1	0.7	1.0
Interest rate 1 percentage point lower	1.5	1.0	0.4	0.8
Gradual progress[1]	0.5	0.4	0.2	0.4
Old age structure	1.6	1.2	0.7	0.8
Young age structure	1.0	0.5	0.1	0.7
High net migration	1.1	0.7	0.2	0.6
Low net migration	1.9	1.4	1.0	1.2
Higher initial health & education spending[2]	1.7	1.3	0.9	1.1
Lower health productivity growth[3]	3.7	3.3	2.8	2.5

[1] Adjustment required each decade.

[2] Assuming health and education spending in 2019-20 are determined by demographics, and that other spending is reduced sufficiently to meet the Government's total spending assumption for that year.

[3] Real health spending per capita growth of 3.3 per cent a year, equivalent to annual productivity in the health care sector of 1.1 per cent.

5.15 Table 5.1 shows that to return the debt to GDP ratio to its pre-crisis level of around 40 per cent of GDP in 2064-65 would require a permanent increase in taxes and/or cut in

spending of 1.1 per cent of GDP (£20 billion in today's terms) in 2020-21 or a series of tax increases or spending cuts worth an additional 0.4 per cent of GDP (£7 billion) each decade. These estimates are slightly larger than in last year's report, reflecting the small deterioration in the primary deficit at the end of the projection period. Targeting debt ratios of 20 and 60 per cent of GDP would require larger and smaller adjustments respectively.

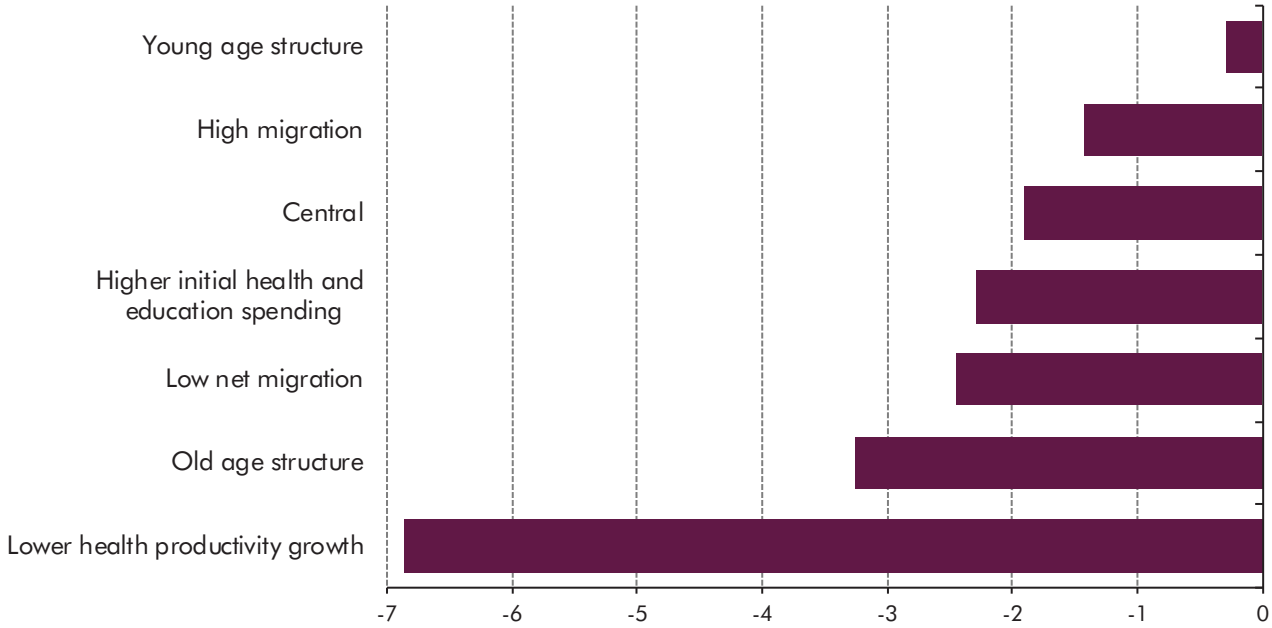
5.16 It should be emphasised that this would be an additional tightening after and on top of the fiscal consolidation that is already in train up to 2019-20, which is expected to improve the primary balance by 9.8 per cent of GDP between the peak deficit in 2009-10 and 2019-20. It would also be in addition to announcements that are expected to affect the public finances over a longer time horizon, such as the intention to link changes to the State Pension age to life expectancy.

5.17 The adjustment to hit any given debt target would be larger if the long-term interest rate were to exceed the economic growth rate by more than we assume in our central scenario, or if migration flows were lower than in our central projection. Of the scenarios we show in Table 5.1, by far the biggest adjustment would be required where we assume that 'unchanged policy' is consistent with real health spending per capita growing at 3.3 per cent a year rather than the 2.2 per cent assumed in our central projection due to lower health sector productivity growth. In this case, the required adjustment to get debt back to 40 per cent of GDP would be a one-off 3.3 per cent of GDP from 2019-20, or 1.2 per cent of GDP in each decade.

5.18 Table 5.1 also shows what would be required to achieve a debt to GDP ratio of 40 per cent ten years earlier, in 2054-55. This would generally require a smaller adjustment, but debt would continue to rise as a share of GDP in subsequent years. More broadly, the focus on a particular target year means that the path of the primary balance and net debt beyond this point is ignored. Ultimately, given our assumptions on interest rates and GDP growth, a small primary surplus is required to prevent net debt continuing on an upward trajectory.

5.19 Chart 5.1 shows the primary balances at the end of the projection period under the different variants, ordered from high to low. The ranking shown in the chart is similar to that implied by the fiscal gap calculations, with the exception of the 'old age structure' variant. The fiscal position would be less sustainable (debt would be rising more quickly) under this variant than in the low migration and higher health care spending variants, but the debt to GDP ratio in 50 years, and hence the implied fiscal gap, would be lower. With the exception of the 'young age structure' variant, none of the one-off fiscal gap estimates to bring debt down to 40 per cent of GDP would be sufficient to keep the ratio at that level further ahead.

Chart 5.1: Primary balance in 2064-65



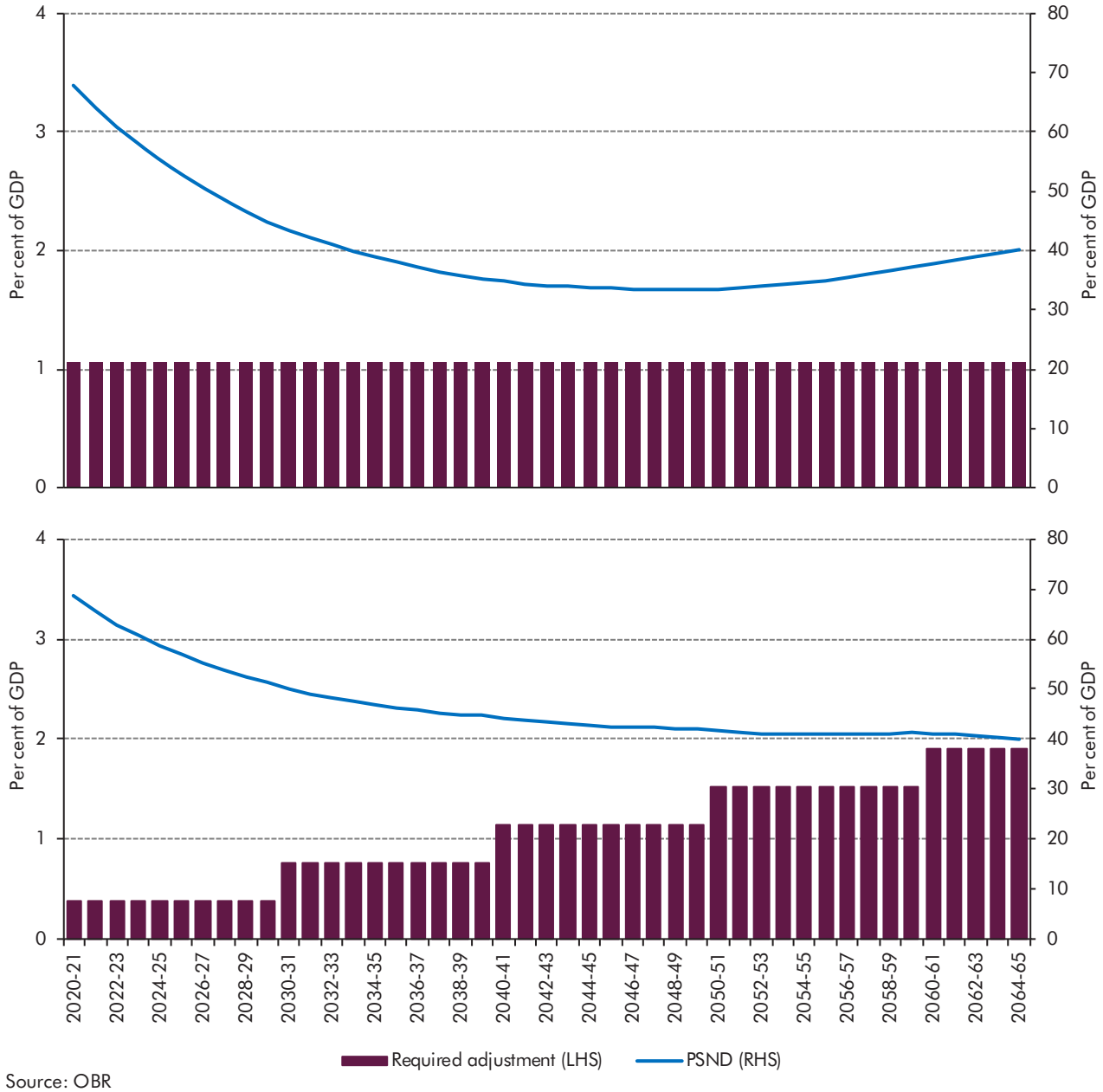
Source: OBR

5.20 Chart 5.2 illustrates the difference that the choice between a one-off permanent adjustment and (an initially smaller, but ultimately larger) cumulative decade-by-decade adjustment makes to the path of net debt en route to the target date. It shows that:

- a once-and-for-all policy tightening of 1.1 per cent of GDP in 2020-21 would see the debt ratio fall below 40 per cent of GDP in the mid-2030s, reach a trough of 33 per cent of GDP towards the end of the 2040s and then rise back to 40 per cent of GDP in 2064-65. But the tightening would be smaller than the 1.9 per cent of GDP required to stabilise the debt ratio over the longer term and so the debt ratio would continue rising beyond the target date; and

- tightening policy by 0.4 per cent of GDP a decade would see the debt ratio fall more slowly, reaching 40 per cent near the end of the projection period. By the target date, the cumulative tightening since 2020-21 would have reached 1.9 per cent of GDP, bringing the primary fiscal position into balance.

Chart 5.2: Alternative adjustments to the primary balance and the implied path of net debt if targeting a debt to GDP ratio of 40 per cent in 50 years



Source: OBR

5.21 The differences highlight the fact that even if policymakers have chosen where they want the debt ratio to end up, there are further choices to be made about the desirable path to get there. They also illustrate the challenge of trying to capture long-term fiscal sustainability in a single measure or gap. In the run-up to the recent financial crisis, several countries endeavoured to 'pre-fund' the costs of an ageing population by tightening fiscal policy sufficiently to bring their net debt to GDP ratios considerably lower. The intention was that when the costs of ageing materialised, they could allow the debt ratio to rise again rather than having to impose much bigger spending cuts and tax increases.

Conclusion

5.22 In our central projection, as well as under most of the variants we consider in Chapter 3, we would eventually expect to see public sector net debt on a continuously rising trajectory as a share of GDP. This would be unsustainable. But, as the European Commission's 2015 *Ageing Report* concludes, the fiscal challenges of an ageing population and non-demographic pressures on health spending are common to many.

5.23 In this chapter, we have examined the scale and timing of potential policy responses that could return the UK's public finances to a sustainable position, given different definitions of what a sustainable position might be. There is no consensus regarding an optimal ratio or how quickly one should try to return to it when the public finances move off course. So the targets and paths that we have set out here should be regarded as purely illustrative, rather than recommendations. As we have demonstrated, even if policymakers do have a target for a particular debt ratio in a particular year, they have many options for the timing of the response and the path of debt in the meantime.

5.24 Clearly it would be unrealistic for any government to set out a fiscal strategy for 50 years and have anyone expect that it would be in a position to implement it all. The main lesson of our analysis is that future governments are likely to have to undertake some additional fiscal tightening beyond the current consolidation planned for the next five years in order to address the fiscal costs of an ageing population and perhaps upward pressures on health spending.

5.25 Our findings should not be taken to imply that the Government needs to achieve a bigger tightening over the next five years than already planned. Rather, policymakers and would-be policymakers will need to think carefully about the long-term consequences of any policies they introduce in the short term. And they should give thought too to the policy choices that will confront them once the current consolidation is complete.

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