

Office for  
**Budget  
Responsibility**

## **Fiscal sustainability report**

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July 2014

# **Office for Budget Responsibility**

## Fiscal sustainability report

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July 2014



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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.

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.

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 our advisory board and 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, the Department for Transport and the Office for National Statistics.

We provided the Chancellor of the Exchequer with a draft set of our projections and conclusions on 26 June, to give him the opportunity to decide whether he wished to make further 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

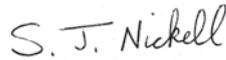
## Foreword

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. A full log of our substantive contact with Ministers, their offices and special advisers can be found on our website.

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



Robert Chote



Steve Nickell



Graham Parker

The Budget Responsibility Committee

# Executive summary

- 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.
- 5 Separate from our central projections, we also look at the long-term sustainability of particular tax revenues. We have updated our assessments of the outlook for oil and gas receipts and transport tax receipts. In both cases we expect revenues to decline over the long term – and to be lower on average over the next few decades than when we last examined them. This suggests that governments will need to find additional revenue streams simply to maintain total revenues as a share of GDP, let alone to meet the additional spending pressures implied by an ageing population.
- 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 around the projections through sensitivity analyses – by varying key assumptions on demographic trends, the medium-term fiscal position and sector-specific trends in 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 2018-19. 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 accumulated on the public sector's balance sheet. We look at two presentations of the balance sheet: the National Accounts and the 2012-13 Whole of Government Accounts (WGA).
- 10 The current and previous governments have 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. The latest published data show PSND at end-March 2014 was £1,273 billion, 76.1 per cent of GDP or £48,200 per household.
- 11 Public sector net worth (PSNW) is a broader balance sheet measure, which includes all physical and all financial assets. PSNW fell sharply from 2008 onwards and the latest outturn data gave a value for PSNW of minus £208 billion at the end of 2012, which was minus 13.2 per cent of GDP. No government has used PSNW as a target, in part because reliable estimates of the value of the public sector's physical assets are hard to construct.
- 12 The medium-term outlook for PSND and PSNW has improved since last year's FSR. Our forecast for the medium-term peak in PSND has fallen by 6.9 per cent of GDP to 78.7 per cent of GDP, with that peak coming one year earlier in 2015-16.
- 13 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. But more information on liabilities of this sort is available in the WGA. These are produced using commercial accounting rules.
- 14 According to the 2012-13 WGA:
  - the net present value of future **public service pension payments** arising from past employment was £1,172 billion or 73.3 per cent of GDP at the end of March 2013. This is £166 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 – much reflects the fact that the projected flow has been converted into a one-off upfront net present value sum using a lower discount rate;
  - the total capital liabilities in the WGA arising from **Private Finance Initiative** contracts were £37 billion, up from £36 billion a year earlier. Only £5 billion of these were on the public sector balance sheet in the National Accounts and therefore included in

PSND and PSNW. If all investment undertaken through PFI had been undertaken through conventional debt finance, PSND would be around 2.0 per cent of GDP higher than currently measured – little changed from last year;

- the liabilities in the WGA include £131 billion (8.2 per cent of GDP) in **provisions** at the end of March 2013 for future costs that are expected (but not certain) to arise, most significantly the costs of nuclear decommissioning. Total provisions have increased by £18 billion since last year's WGA, mainly those related to nuclear decommissioning at the Sellafield site, clinical negligence claims and a new provision for the loss of revenues when North Sea companies set off the costs of oil and gas field decommissioning against their tax bills. (This was shown as a contingent liability in last year's accounts.) Around £13 billion of provisions were actually used in 2012-13, which was close to the expectation set out in the previous year's WGA; and
  - the WGA identified £88 billion (5.5 per cent of GDP) of quantifiable **contingent liabilities** – 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 £13 billion reduction compared with last year was more than accounted for by the removal of the £20 billion oil and gas field decommissioning contingent liability. This now appears partly as a provision, but only for the period to 2017-18. Contingent liabilities relating to export finance and to clinical negligence cases were the main offsetting increases.
- 15 Overall gross liabilities in the WGA increased by £276 billion over the year to reach £2,893 billion at end-March 2013. 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.
- 16 As 2012-13 was a year in which the Bank of England expanded its quantitative easing (QE) programme, the WGA show a rise in 'government borrowing and financing' – in other words gilts sold to the private sector – of just £31 billion. This comprises net issuance of £115 billion of debt by central government, largely offset by an £84 billion increase in gilts held within the public sector by the Bank of England. The WGA show an increase in 'other financial liabilities' associated with the reserves created by the Bank of England to finance the QE gilt purchases.
- 17 The WGA measure of the budget deficit – called 'net expenditure' in the accounts – was 11.4 per cent of GDP in 2012-13, down slightly from 2011-12. The WGA net deficit in 2012-13 was unchanged from its level in 2009-10. This is in marked contrast to the National Accounts measure of the current deficit, which fell by a quarter over the same period. The different paths can be explained by different accounting concepts, including changes in provisions that are carried through to the WGA measure of the budget deficit. Provisions reduced the WGA net deficit by 1.9 per cent of GDP in 2009-10 (when a £25 billion provision related to the Asset Protection Scheme was reversed), but increased it by 1.0 per cent of GDP in 2012-13.
- 18 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 £757 billion or 47.4 per cent of GDP in March 2013. They have increased by £4 billion since last year's WGA. The overall net liability in the WGA was £1,630 billion or 102 per cent of GDP at end-March 2013. This compares with PSND of £1,185 billion or 74.2 per cent of GDP at the same date, and to a WGA net liability of £1,347 billion or 86.7 per cent of GDP a year earlier at end-March 2012.

- 19 In this year's report, we have again summarised policy announcements relating to guarantees and possible contingent liabilities that we would expect to appear in subsequent years' WGA. Key among these are schemes related to housing, exports and infrastructure.
- 20 While the precise accounting treatment of these measures will not be known until future WGAs are published, some broad implications for fiscal sustainability are clear. Most importantly, while each measure in isolation could well be considered a remote contingent liability, the probabilities of the various liabilities crystallising are likely to be correlated. In particular, the probability that the various parties to which the Government is exposed will default would increase in the event of a future economic downturn, particularly if it was focused on the housing and financial sectors. The more serious the downturn, the greater the likelihood that a large proportion of contingent liabilities will crystallise to the detriment of fiscal sustainability.
- 21 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 projections

- 22 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 2014 *EFO*. This allows us to focus on long-term trends rather than making revisions to the medium-term forecast.

## Demographic and economic assumptions

- 23 Demographic change is a key long-term pressure. 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, relatively low levels of fertility, and the retirement of people born during the post-war 'baby boom'.
- 24 We base our analysis on projections of the UK population produced by the Office for National Statistics (ONS) every two years. In this *FSR* we use its 2012-based projections for the first time. The main changes since the previous projections are an increase in the estimated size of the

population following the census, lower net migration (and a change in the profile of age-specific migration flows) and higher fertility rates in the longer term. As a result, by 2063-64 the latest projections suggest that there will be more elderly people, fewer working age people and roughly the same number of children as in the previous projections. Our central projection for the public finances uses the ONS 'low migration' population variant. This assumes net inward migration of 105,000 a year, which we consider reasonable given international trends and the direction of Government policy. We test the sensitivity of our results to a number of different demographic assumptions.

- 25 As regards the economy, we assume in our central projection that whole economy productivity growth will average 2.2 per cent a year on an output per worker basis, in line with the long-run average rate. We assume CPI inflation of 2.0 per cent (in line with the Bank of England's inflation target) and a long-term GDP deflator inflation rate of 2.2 per cent. These assumptions are unchanged from last year's *FSR*.
- 26 In our latest *EFO*, we forecast the output gap to close within the forecast period, so the long-term projections in this *FSR* start from a position where the economy is operating in line with our estimate of its underlying potential. That was not the case last year, when our medium-term forecast showed spare capacity remaining at the end of the forecast period and our long-term projections started with a period of above-trend growth until the output gap had closed.

## Defining 'unchanged' policy

- 27 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.
- 28 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 lead to an unrealistic projection. 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".
- 29 In our central projections, our assumption for unchanged policy is that beyond 2018-19 underlying age-specific spending on public services, such as health and education, rises in line 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 2018-19:
- 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 1.1 per cent and 0.7 per cent of GDP respectively between 2015-16 and 2018-19 (equivalent to £23 billion and £15 billion in nominal terms in 2018-19);

- alternatively, we could assume for these three years – as we do beyond 2018-19 – 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 three years. The Government would then have to find cuts in other spending of 1.9 per cent of GDP (£39 billion in nominal terms in 2018-19) to stick to its announced policy assumption for total spending.

30 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 earnings in the rest of the economy.

## Results of our projections

31 Having defined unchanged policy, we apply our demographic and economic assumptions to produce projections of the public finances over the next 50 years.

### Expenditure

32 Population ageing will put upward pressure on public spending. Our central projection shows spending excluding debt interest rising from 34.3 per cent of GDP at the end of our medium-term forecast in 2018-19, to 39.3 per cent of GDP by 2059-60, before falling slightly to 39.1 per cent of GDP in 2063-64. That would represent an overall increase of 4.8 per cent of GDP or £79 billion in today's terms.

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

- **health spending** rises from 6.4 per cent of GDP in 2018-19 to 8.5 per cent of GDP in 2063-64, rising smoothly as the population ages. This is a slightly smaller rise than we projected last year, in part due to the additional overall spending cuts the Government has pencilled in for 2018-19 (which are included in our medium-term forecast). We assume that these affect all types of spending proportionately. We test the sensitivity of our projections to this assumption (described below);
- **state pension costs** increase from 5.5 per cent of GDP in 2018-19 to 7.9 per cent of GDP in 2063-64 as the population ages. Spending is lower by the end of the projection than last year. The projection has been pushed higher by the updated population projections, but reduced by the Government's policy of linking the State Pension age (SPA) to longevity. We assume that this brings forward the rise in the SPA to 68 and introduces rises to 69 and 70 within the projection horizon; and
- **long-term social care costs** rise from 1.2 per cent of GDP in 2018-19 to 2.3 per cent of GDP in 2063-64, 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.

## Revenue

- 34 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. Some non-demographic factors are explored separately in the report.
- 35 In our detailed analysis this year, we have returned to the issue of North Sea revenues. We find again that receipts are likely to fall to below 0.1 per cent of GDP over the coming decades. Our central projection suggests around £40 billion will be raised in North Sea revenues in total between 2019-20 and 2040-41, down by around a quarter relative to last year's report. The majority of this change is explained by lower production in our latest medium-term forecast, which knocks through to our long-term projection. We have considered a wide range of alternative oil price and production scenarios, all of which imply that oil and gas receipts are on a declining trend as total production from the UK continental shelf moves towards its ultimately recoverable capacity. In considering these projections, it is important to note that oil and gas receipts are the most volatile revenue streams in the UK public finances and forecasting them over even short horizons is extremely difficult. The same factors that make North Sea receipts volatile on a year-to-year basis make it very hard to predict the pace of the long-term trend decline with any confidence.
- 36 We have also revisited our previous analysis of the effects of improving fuel efficiency on transport taxes – fuel duty and vehicle excise duty (VED). Greater fuel efficiency reduces fuel duty receipts by reducing the volume of fuel consumed for a given number of miles travelled and reduces VED receipts because most rates paid are graduated according to fuel efficiency. Both are forecast to fall as a share of GDP in our latest medium-term forecast and our long-term projections show that trend continuing. The fuel duty projections are the more sensitive to faster or slower progress in fuel efficiency. Failing to revalorize fuel duty with RPI inflation – instead freezing rates in cash terms from the end of the medium-term forecast period – would cause a sharper reduction in fuel duty receipts than in any fuel efficiency scenario we consider.
- 37 In Annex A to this year's report, we have looked in more detail at employment and earnings trends that are relevant to the sustainability of the public finances. An important consequence of the rising employment and falling real wages of recent years has been to reduce the effective tax rate on labour income. More people working means more personal allowances to offset against earnings before tax is paid. Our long-term projections assume that the effective tax rate on labour income trends very slowly lower due to demographic trends. If labour market trends led to a higher or lower path for the effective tax rate on labour income, the outlook for fiscal sustainability would be correspondingly better or worse.
- 38 Our analysis of longer-term pressures on revenue streams suggests that governments will, over time, need to find new sources of revenue to maintain the overall ratio of revenue to national income, let alone to meet the spending pressures from an ageing population.

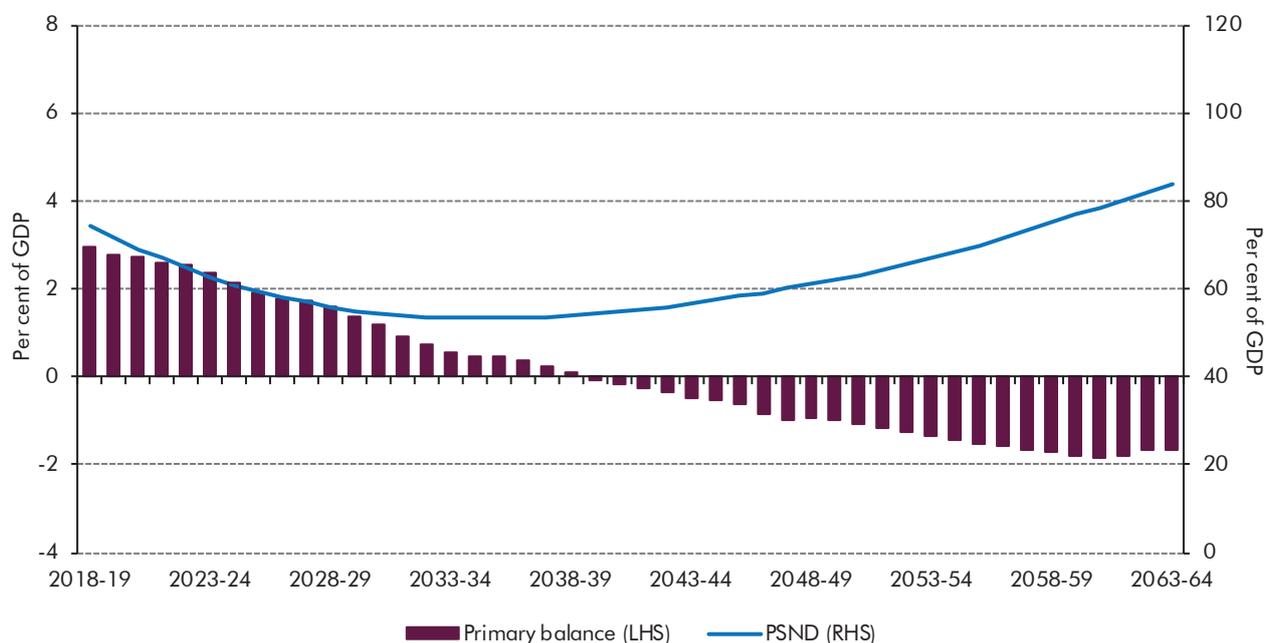
## Financial transactions

- 39 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 into account the impact of public sector financial transactions. These affect net debt directly, without affecting accrued spending or borrowing.
- 40 For the majority of financial transactions, we assume that the net effect is zero. Student loans are an important exception. Since last year's report, the Government's decision to sell the pre-2012 student loan book has exchanged some future loan repayments for upfront sale proceeds, while crystallising the loss associated with interest rate and write-off subsidies. Removing the cap on student numbers increases the annual outlays on student loans in England to 0.7 per cent of GDP a year in the long term, up 0.2 per cent of GDP from last year's report. Projections for repayments are only a little higher, despite a larger number of students making repayments, as repayments per student are now projected to be lower. We project that the direct flows will add 5.4 per cent of GDP to net debt in 2018-19, rising to 9.8 per cent of GDP by the mid-2030s, and then falling to 8.3 per cent of GDP in 2063-64.
- 41 In Annex B, we look in more detail at student loans, including how they are treated in the National Accounts, the Whole of Government Accounts and the Government's budgeting framework. We test the sensitivity of our projections to different assumptions about the uprating of fees, the number of students and the volatility of graduate earnings.

## Projections of the primary balance and public sector net debt

- 42 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 3.0 per cent of GDP in 2018-19 to rough balance in the late-2030s and then to a deficit of 1.7 per cent of GDP in 2063-64 – an overall deterioration of 4.7 per cent of GDP, equivalent to £77 billion in today's terms.
- 43 Taking this and our projection of financial transactions into account, PSND is projected to fall from its medium-term peak of around 79 per cent of GDP in 2015-16 to just over 53 per cent of GDP in the mid-2030s, before rising to 84 per cent of GDP in 2063-64. Beyond this point, debt would remain on a rising path.

Chart 1: Central projection of the primary balance and PSND



Source: OBR

- 44 The primary balance and PSND at the end of the projection period have improved relative to last year. That reflects the net effect of a number of offsetting factors:
- the latest ONS population projections suggest that there will be proportionately more young and old people in the population, and fewer of working age, than the previous projections. This worsens the primary balance and raises the debt ratio;
  - spending cuts pencilled in for 2018-19 improve the primary balance, which knocks through to the long-term projections; and
  - linking the State Pension age to longevity is assumed to bring forward the rise to 68 and to bring rises to 69 and 70 within the projection horizon, which improves the primary balance and reduces the debt ratio.
- 45 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.
- 46 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.
- 47 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 5.9 per cent of GDP by 2063-64. 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 2018-19. This would be compounded by the demographics to increase health (and therefore total) spending by a further 0.4 per cent of GDP by 2063-64.

## Summary indicators of fiscal sustainability

- 48 In our central projections, and 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 continuously rising trajectory as a share of national income. This would be unsustainable.
- 49 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'.
- 50 The current Government does not have a long-term target for the debt to GDP ratio. So, for illustration, we calculate the additional fiscal tightening necessary from 2019-20 to return PSND to 20, 40 or 60 per cent of GDP at the end of our projection horizon in 2063-64.
- 51 Under our central projections, a once-and-for-all policy tightening of 0.9 per cent of GDP in 2019-20 (£15 billion in today's terms) would see the debt ratio reach 40 per cent of GDP in 2063-64. But this is less than the 1.7 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 0.3 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 fiscal gap estimates are slightly lower than in last year's report, reflecting the slightly smaller primary deficit and lower PSND 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.
- 52 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 2018-19 than we forecast in the *EFO*, the necessary tightening would be bigger or smaller by the same amount.
- 53 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. The most dramatic would be the scenario of weaker productivity in the health sector pushing up spending per person.

# 1 Introduction

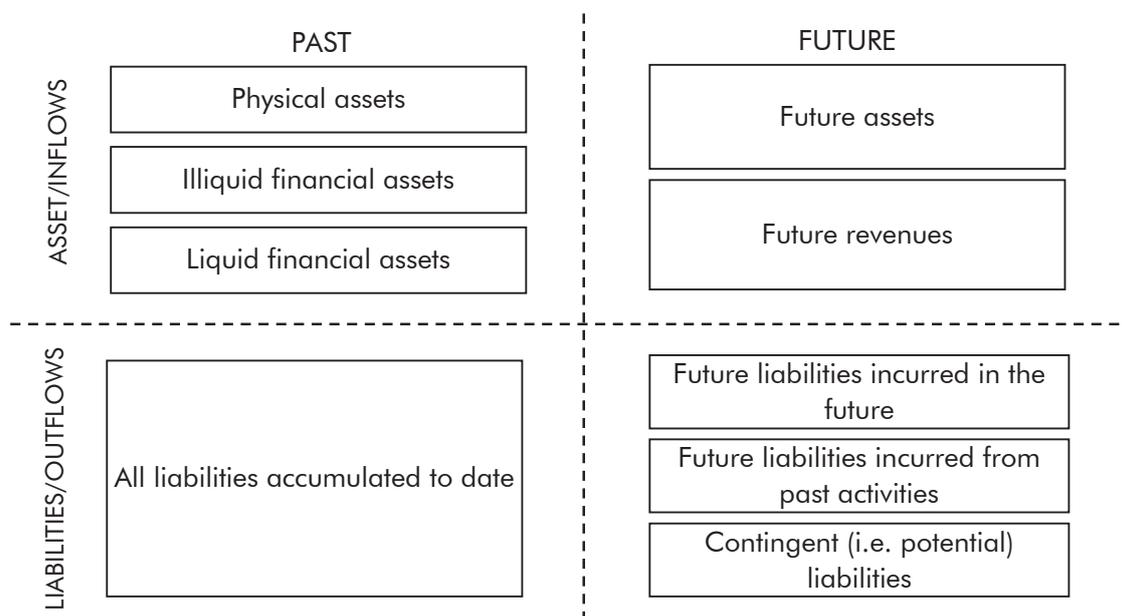
## A framework for analysing fiscal sustainability

- 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. And also 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.<sup>1</sup>

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<sup>1</sup> 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 they rarely appear to, 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 look at 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 liquid financial assets – that is, those assets that could be readily sold. Governments have also reported estimates of public sector net worth (PSNW), which compares the public sector's liabilities with *all* of its assets, so including the physical and illiquid financial assets that are excluded from PSND.
- 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

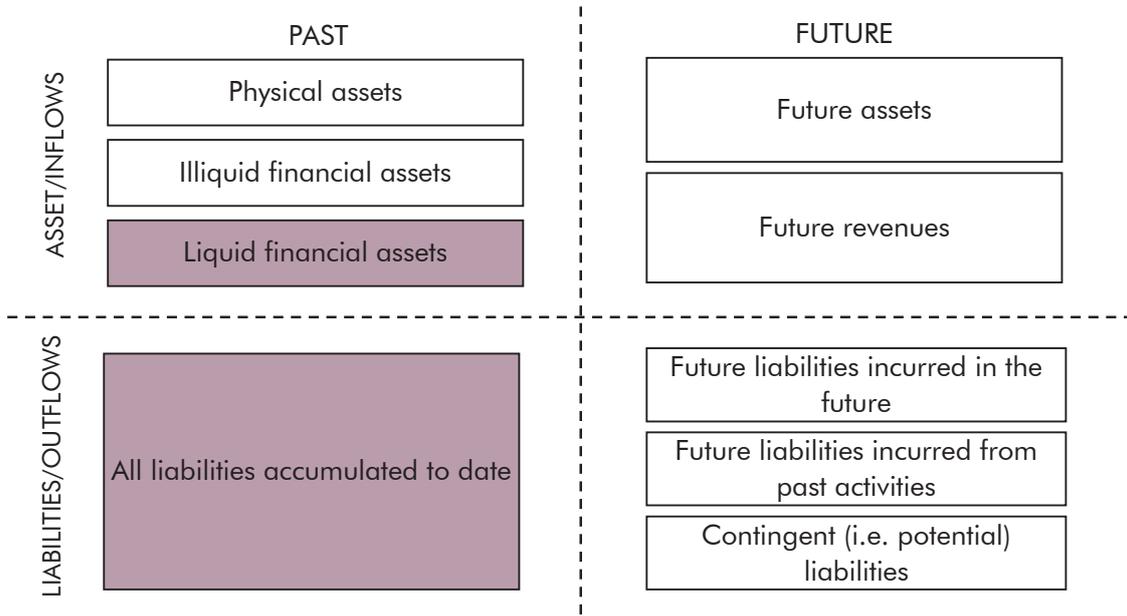
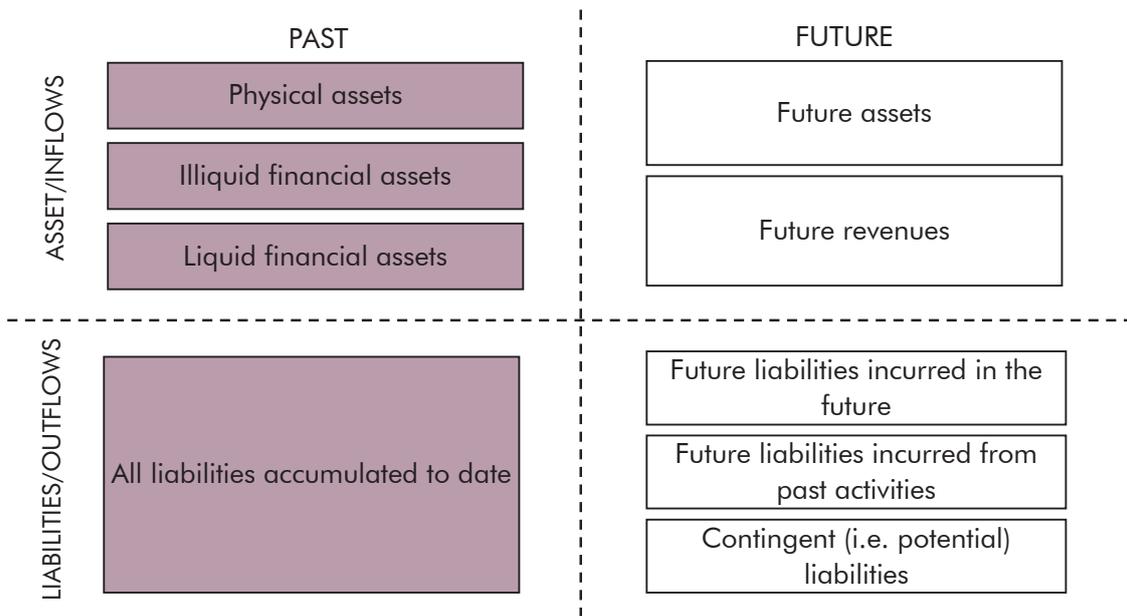


Figure 1.3: Coverage of public sector net worth

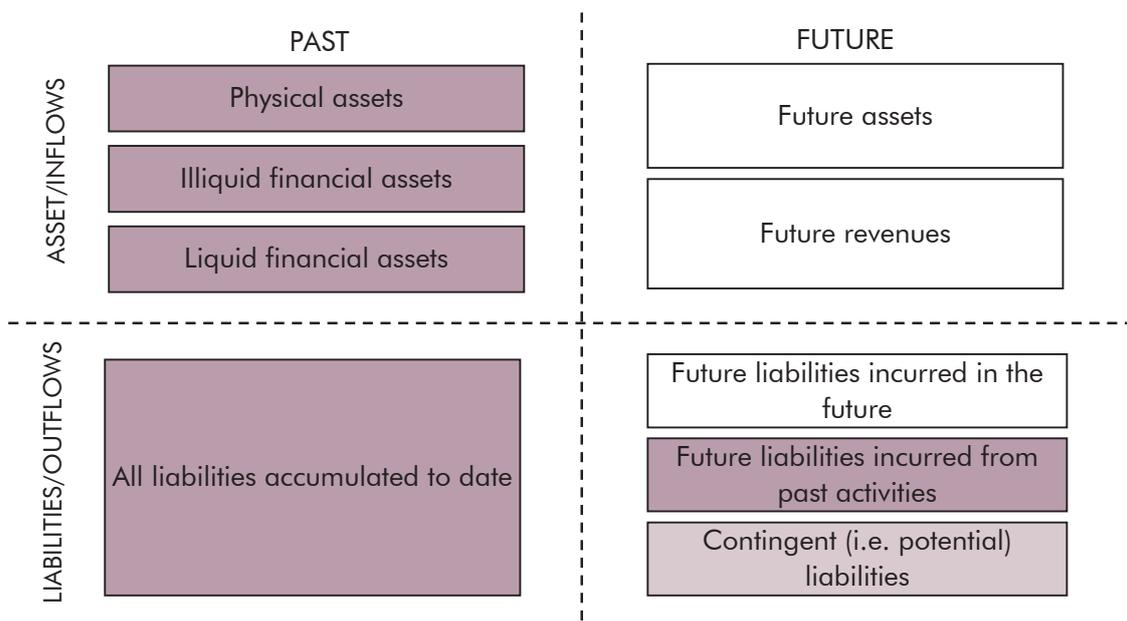


1.12 Some of these gaps are addressed in the WGA. The WGA are consolidated financial statements for the public sector, compiled in line with International Financial Reporting Standards as adapted for the public sector. They include an accruals-based balance sheet.

1.13 The WGA captures a wider, but still incomplete, range of the activities identified in the previous section, as shown in Figure 1.4. 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 fourth year in which the WGA have been published. We focus on the latest figures for 2012-13 and the restated figures for 2011-12. Prior years have not been restated, so the full 4-year time series is less 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 balance sheet amounts. Changes to discount rates between WGA publications can significantly change estimates of assets and liabilities in the absence of changes to underlying cash flows.

Figure 1.4: Coverage of the WGA measure of net liabilities

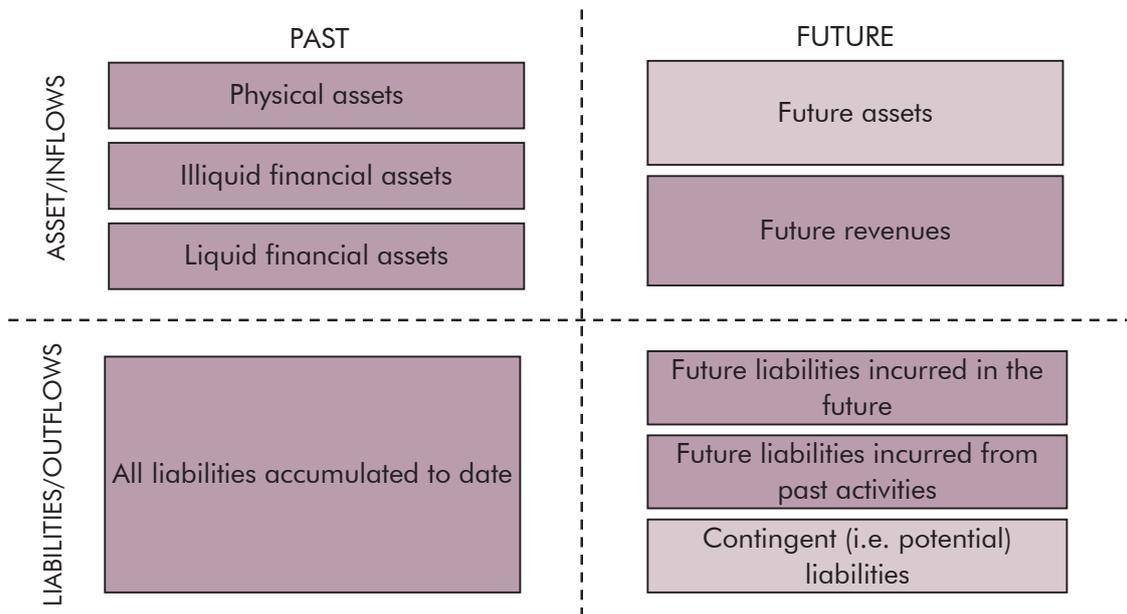


### Future activity: Long-term spending and revenue projections

- 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 2014 *Economic and fiscal outlook (EFO)*, so as to focus on longer-term influences rather than revisions to our assessment of the short and medium-term outlook. But changes to the final year of our medium-term forecast, the launch point for our long-term projections, can have a big effect on the assessment of long-term sustainability, which we highlight in the report.

- 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 forecast 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. In Chapter 4 of this report, we look at the effect of long-term trends on UK oil and gas revenues and transport taxes.

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 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*, 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".
- 1.28 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.
- 1.29 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

- 1.30 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 the sustainability of revenues; and
  - Chapter 5: considers summary indicators of fiscal sustainability.
- 1.31 Over the years, we have presented a range of additional analyses and detailed descriptions of the approaches we take, in *FSR* annexes and via supplementary material on our website.

This year, as well as the usually supplementary material online, this report includes the following additional analyses:

- Annex A: looks in detail at a number of recent labour market trends and considers how they might affect our assessment of fiscal sustainability; and
- Annex B: considers the implications for fiscal sustainability of a number of factors that could affect the long-term costs of student loans.

## 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). The WGA for 2012-13 were published on 10 June this year. This latest WGA release means that we now have four years of WGA data, covering 2009-10 to 2012-13.<sup>1</sup>

### 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.<sup>2</sup> The current and previous Governments have both set targets for PSND. The measure of PSND that is currently being targeted, and which is used throughout this document, is 'PSND ex'. This currently excludes the temporary effects of the current and previous governments' interventions to stabilise the financial sector.

2.4 The ONS is making some large changes to PSND ex this year, to implement the conclusions from 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).<sup>3</sup> We explained these changes in Annex B of our March 2014 *Economic and fiscal outlook (EFO)*. The measure of PSND ex that we are using in this report does not reflect these changes, but we do look ahead to see how these changes will affect the differences between the WGA and the National Accounts aggregates. We will produce forecasts for the public sector fiscal aggregates on the new ONS definitions in our next *EFO*, later this year.

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

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<sup>1</sup> HM Treasury (2014a). 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.

<sup>2</sup> More details of how PSND is measured are available in O'Donoghue (ONS) (2009).

<sup>3</sup> ONS (2014a)

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

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 further below.

- 2.6 The previous 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 this level. At the end of 2013-14, PSND was £1,273 billion, or 76.1 per cent of GDP, or £48,200 per household.<sup>4</sup> The current Coalition Government set a supplementary target to have PSND falling as a share of GDP at a fixed date of 2015-16. The forecasts shown in Chart 2.1 are from our March 2014 *EFO*. As we reported then, PSND is forecast to rise by 1.5 per cent of GDP in 2015-16, so that the Government is currently not on track to meet its supplementary target.
- 2.7 The ONS also publishes a wider National Accounts balance sheet measure: public sector net worth (PSNW), which measures the public sector's financial liabilities net of all financial and non-financial assets.<sup>5</sup> These include financial assets such as shares and other equities, long-term loans, medium and long-term bonds, and also the public sector's stock of non-financial assets, such as the road network. The latest available outturn data for end-2012 gave a value for PSNW of minus £208 billion, which was minus 13.2 per cent of GDP.<sup>6</sup>
- 2.8 Chart 2.1 shows the recent levels of PSND and PSNW. It shows how movements in PSND and PSNW tend to mirror each other. This is because the value of public sector 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 public sector investment. However, much of the additional borrowing in recent years has been used to fund current rather than capital spending. Over the five years from 2009-10 to 2013-14, the public sector borrowed £618 billion, but only spent £164 billion of this on net investment.<sup>7</sup> Indeed, of the £1.5 trillion of debt that we forecast to be outstanding by 2018-19, £828 billion will have been incurred financing deficits over the decade from 2009-10 onwards, with only £304 billion of this borrowing financing net investment and the remaining £524 billion financing current deficits. This preponderance of borrowing to finance current deficits rather than net investment means that PSNW has worsened by even more than PSND has risen.
- 2.9 Unlike PSND, PSNW stabilised and briefly improved during 2012. This reflected the temporary boost to public sector assets from the government's equity holdings in the Bank of England's Asset Purchase Facility, before these cash surpluses were transferred to the Exchequer from January 2013 onwards. This meant that PSNW benefited before PSND, and the difference in their paths is just a timing issue. When the surpluses were subsequently

<sup>4</sup> Based on there being 26.4 million UK households in 2013, from ONS (2013a).

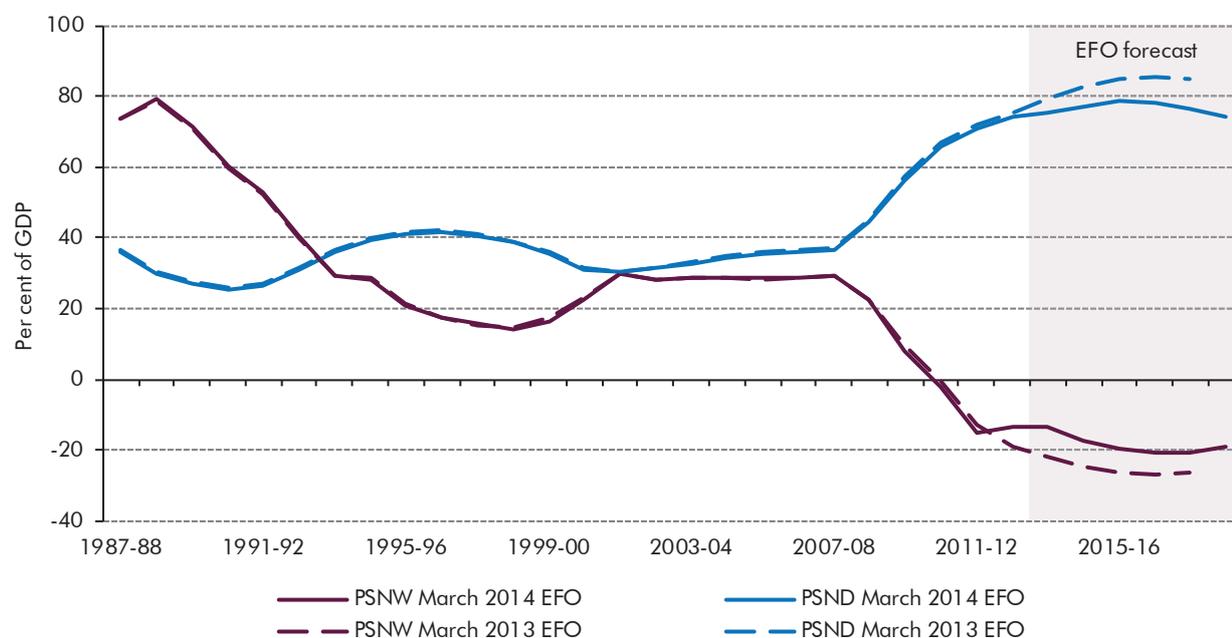
<sup>5</sup> PSNW is derived from National Accounts estimates of general government and public corporations assets and liabilities, which are published in the Blue Book. The composition of PSNW is set out in Hobbs (ONS) (2010).

<sup>6</sup> Where statistics for aggregates as a percentage of GDP are published, then figures used in this document are the latest published statistics. Elsewhere, where we have calculated outturn and forecast data as a percentage of GDP, then the GDP data used are the GDP outturn and forecast data from our March 2014 *EFO*.

<sup>7</sup> These figures both exclude the £28.0 billion of Royal Mail assets received in 2012-13, which reduced PSNI and net borrowing.

transferred to the Exchequer, the surpluses reduced PSND, but PSNW did not change, since both assets and liabilities were reduced.

Chart 2.1: Recent levels and forecasts of PSND and PSNW



Source: ONS, OBR

2.10 Table 2.1 below shows that our forecast for PSND in the March 2014 *EFO* is around 8 percentage points lower in 2017-18 than in the March 2013 *EFO*. Upward revisions to growth have reduced borrowing forecasts and boosted nominal GDP. Nominal GDP was also revised higher due to methodological changes in last year's Blue Book.

Table 2.1: Changes in PSND from March 2013 *EFO* to March 2014 *EFO*

	Per cent of GDP <sup>1</sup>					
	Outturn		Forecast			
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
PSND in March 2013 <i>EFO</i> <sup>2</sup>	75.1	79.2	82.6	85.1	85.6	84.8
PSND in March 2014 <i>EFO</i>	74.2	75.4	77.3	78.7	78.3	76.5
<b>Change</b>	<b>-0.9</b>	<b>-3.8</b>	<b>-5.3</b>	<b>-6.4</b>	<b>-7.3</b>	<b>-8.3</b>
<i>Of which:</i>						
Change in nominal GDP <sup>1</sup>	-0.6	-2.1	-2.9	-2.9	-3.0	-2.9
Change in cash level of net debt	-0.2	-1.7	-2.4	-3.5	-4.3	-5.3

<sup>1</sup> Non-seasonally adjusted GDP centred end-March.

<sup>2</sup> Figures for 2012-13 and 2013-14 are derived using the latest PSND outturns from the June 2014 PSF release, and GDP outturn and forecast consistent with our March 2014 *EFO* forecast.

2.11 Lower borrowing and higher nominal GDP over the forecast period have also increased our forecast for PSNW in 2017-18 by around 6 per cent of GDP relative to our forecasts shown in last year's *FSR*.

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

2.12 As we described in last year's *FSR*, there is also a difference in how financial liabilities are measured in PSND and PSNW: in PSND these are measured at nominal (redemption) value, whereas in PSNW they are measured at market value. This means that movements in bond prices change PSNW. This difference became more prominent during the financial crisis, when the fall in bond yields (and the consequent rise in bond prices) pushed up financial liabilities in PSNW faster than net gilt issuance pushed up PSND. But this effect unwinds over the forecast period: the assumption that bond prices will fall means that the rise in financial liabilities in PSNW will be slower than the increase in net gilt issuance in PSND. Given that the market and nominal values will converge at the point of redemption, and that the Government will need to refinance the public sector financial liability on redemption, under normal circumstances the Government should care more about the nominal values. In this respect, PSND is a more relevant measure of the public sector financial liability than PSNW.

### Further developments in the National Accounts over the next year

- 2.13 The ONS forward work programme also explains that, under the latest European regulations and directive, all European Member States will be required to publish more data on government contingent liabilities.<sup>8</sup> These will cover government guarantees, non-performing loans (such as student loans that are not repaid), PFI deals that are not included on the balance sheet in the National Accounts, and government investment in public corporations. ONS will be required to submit this information to Eurostat at the end of the year, and it will also be published.
- 2.14 This further ONS information on government guarantees, student loans and PFI deals will form a useful addition to the existing body of knowledge on these future liabilities that is presented in the rest of this chapter, and we look forward to including this information in next year's *FSR*.

### International comparisons of debt

- 2.15 National Accounts measures are compiled under internationally agreed rules, which allow cross-country comparisons to be made. Not all countries measure net debt in a way that can be compared directly with the UK's measure of PSND. Figures are more often available for the narrower general government net debt, which excludes public corporations.
- 2.16 The IMF publishes estimates of general government net debt for different countries in its World Economic Outlook (WEO). Chart 2.2 shows the IMF's latest estimates for 2011 and forecasts for 2018 for the G7 economies, ordered by the change in debt over the period (from the biggest fall – Germany – to the biggest rise – Japan). These figures were taken from the April 2014 WEO. On this measure, UK general government net debt was 77 per cent of GDP in 2011 and is forecast by the IMF to rise to 81 per cent in 2018. Chart 2.3 shows that the IMF has reduced its forecast for UK general government net debt in 2018 by 10 per cent of GDP since the April 2013 WEO figures we reported in last year's *FSR*. This is

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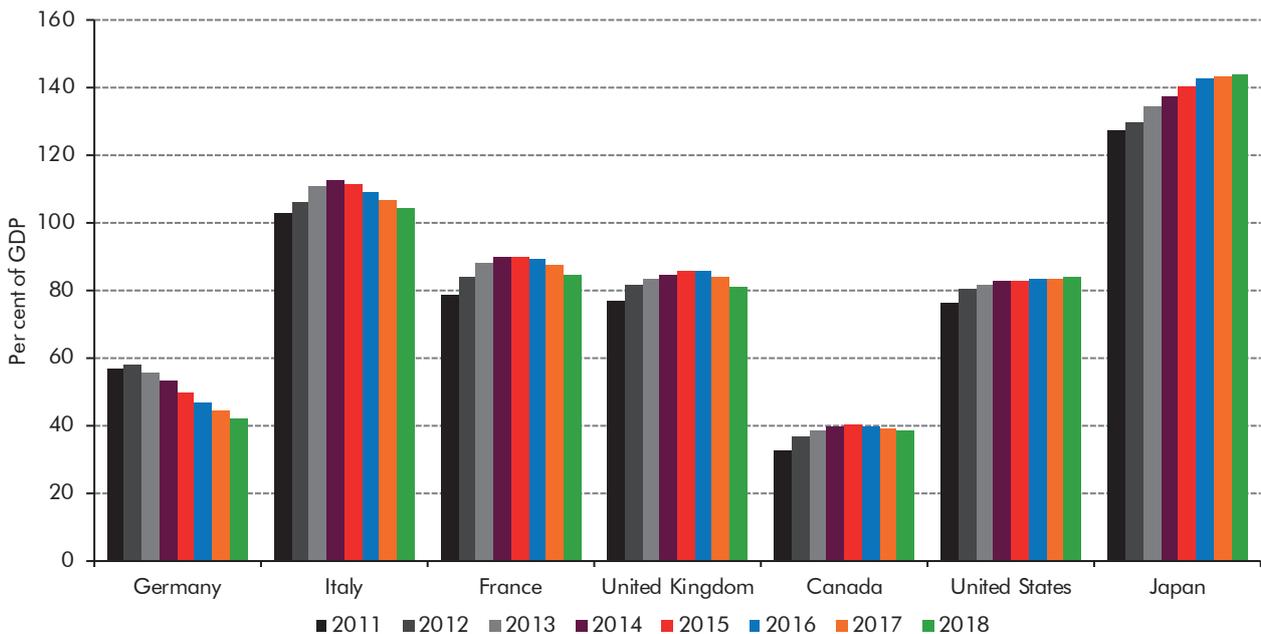
<sup>8</sup> ONS (2013b)

the second largest downward revision of the G7 countries reported here. We have revised our forecast for PSND down by a similar 8.3 per cent of GDP over the same period.

2.17 In 2018, the IMF forecasts the UK to have the third lowest net debt ratio in the G7, 5 per cent of GDP lower than the G7 average. The other G7 countries have a very wide range of net debt levels: at the lower end, Canada and Germany are forecast to have net debt ratios around 40 per cent of GDP by 2018; at the higher end, Italy and Japan are forecast to have net debt ratios of around 100 and 140 per cent of GDP, respectively. Within the G7, only Germany is forecast to have a lower net debt ratio in 2018 than it had in 2011.

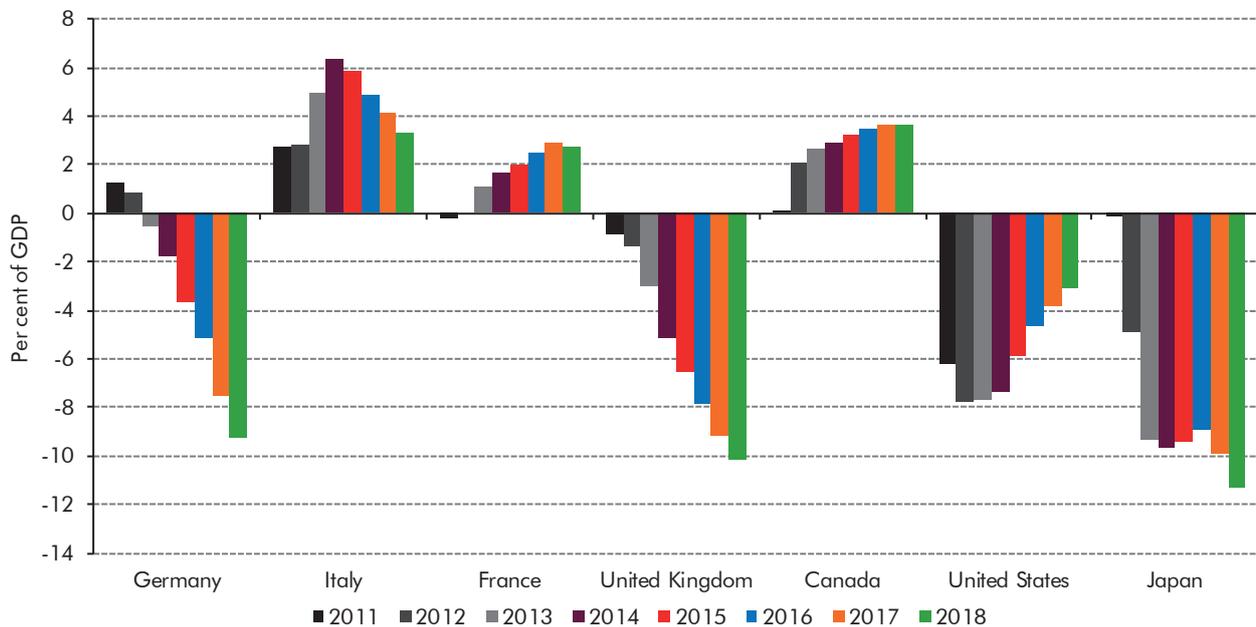
2.18 We published our own forecasts of general government net debt on the IMF definition in Table 4.46 of our March 2014 *EFO*, consistent with our own PSND forecast. Using the IMF definition, we forecast that general government net debt would rise to 79.8 per cent of GDP in 2018, close to the IMF's April WEO forecast given above.

Chart 2.2: Latest IMF forecasts for general government net debt in the G7 countries



Source: IMF

Chart 2.3: Movements in IMF forecasts for general government net debt between April 2013 and April 2014



Source: IMF

## Balance sheet measures from WGA

- 2.19 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 four years from 2009-10 to 2012-13. The construction of the WGA was described in detail in our 2011 *FSR*, and in the Treasury's WGA publications.<sup>9</sup>
- 2.20 In this chapter, we will discuss the key results from the latest WGA for 2012-13, look at what has changed since last year's WGA, consider the main measurement differences between the WGA and the National Accounts, and show how the main WGA results have changed over the four years that have so far been published.
- 2.21 WGA paints a broader picture of the public sector balance sheet than the National Accounts, as shown in Figure 1.4 in Chapter 1. Both PSND and PSNW are limited in that their coverage is entirely backward-looking. They do not include future liabilities incurred as a result of past government activity. In contrast, 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 may materialise as a result of past activities.

<sup>9</sup> HM Treasury (2014a)

## What's new in the 2012-13 WGA

- 2.22 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 results for the previous year are restated so that the two sets of results can be compared on a like-for-like accounting basis.
- 2.23 In the 2012-13 WGA, the changes to accounting methods and the WGA boundary have been relatively minor. The accounts for 2011-12 have been restated so that the totals for gross liabilities and gross assets have each increased by £3 billion, which net out so that the total for net liabilities is unchanged.<sup>10</sup> There are no changes at all to the restated flows for income and spending in 2011-12.
- 2.24 Each year all assets and liabilities on the WGA balance sheet are revalued using the latest assumptions about market prices, discount rates and other estimates. Previous year's results are not restated for these changes. This makes comparisons between years difficult, particularly where the net present value of future liabilities is revised due to changes in discount rates. (See the discussion from paragraph 2.43 below.)
- 2.25 The 2012-13 WGA state that the WGA boundary will be widened further in future, to include Bradford and Bingley and Northern Rock (Asset Management) plc (NRAM) for 2013-14, and Network Rail for 2014-15.
- 2.26 Table 2.2 shows the latest aggregate results from the 2012-13 WGA, and how these aggregates have changed since last year's WGA. Total net liabilities are estimated at £1,630 billion at end-March 2013, and to have increased by £282 billion since end-March 2012. This is mainly the result of an increase in gross liabilities of £276 billion. Changes in gross liabilities and gross assets are discussed below.
- 2.27 Table 2.2 shows that the WGA measure of the net deficit – described as 'net expenditure' in the accounts – fell from £185 billion in 2011-12 to £179 billion in 2012-13. This £7 billion fall is broadly similar to the £4 billion fall in the current deficit as measured in the National Accounts, which fell from £89 billion in 2011-12 to £85 billion in 2012-13. However, given the large differences in measurement between these two different accounting systems, even this level of agreement is unusual. Chart 2.5, later in the chapter, shows how the two different accounting systems have produced very different results over the past four years.

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<sup>10</sup> The changes reflect the inclusion of certain NHS charities, the correction of an error in the estimate of the pension liability for the Scottish Teachers Pension Scheme, and a classification adjustment in the figures for the Exchange Equalisation Scheme. Further details are given in Note 39 of the 2012-13 WGA.

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

Table 2.2: Changes in the WGA public sector summary aggregates

	£ billion		
	2011-12 restated	2012-13	Difference
<b>Balance sheet levels at end of year:</b>			
Liabilities	-2,618	-2,893	-276
Assets	1,271	1,264	-7
<b>Net liabilities</b>	<b>-1,347</b>	<b>-1,630</b>	<b>-282</b>
<b>Flows during financial year:</b>			
Revenue	-617	-621	-4
Direct expenditure	648	666	18
Impairments and other costs from revaluations	67	51	-16
Net financing cost and other gains and losses <sup>1</sup>	87	82	-5
<b>Net expenditure<sup>2</sup></b>	<b>185</b>	<b>179</b>	<b>-7</b>

<sup>1</sup> Other gains and losses includes the revaluation of financial assets and liabilities and net loss on disposal of assets.

<sup>2</sup> 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.

2.28 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 2.2 above separates out the main effects of the impairments and revaluation costs within the net deficit. The remaining expenditure is termed 'direct expenditure', which should be more comparable across years.

## Changes in WGA gross liabilities

2.29 Table 2.3 presents more detail on the WGA gross liabilities. Total WGA gross liabilities increased by £276 billion in 2012-13, reaching £2,893 billion at end-March 2013.

2.30 Table 2.3 shows that the £276 billion rise was mainly the result of:

- an increase of £31 billion in government borrowing and financing. This comprises net issuance of £115 billion of debt by central government, largely offset by an £84 billion increase in gilts held within the public sector by the Bank of England Asset Purchase facility (BEAPFF), as part of the Bank's quantitative easing programme (QE);<sup>11</sup>
- an increase of £69 billion in other financial liabilities. This mainly reflects the additional reserves that the Bank of England created to finance the BEAPFF's £84 billion increase in gilt holdings during 2012-13. This increase in liabilities was partly offset by a £7 billion reduction in the deposits by banks that form part of the cash management operations by the Debt Management Office (DMO); and
- an increase of £166 billion in the estimated net public service pension liability. A large part of this increase (up to £57 billion) reflects a reduction in the discount rate used to calculate this liability. A further £31 billion of this increase reflects the changes in how

<sup>11</sup> See Box 2.1 of our 2013 FSR for a full explanation of how QE and APF transactions are treated in the WGA.

the Royal Mail pension liabilities appear in the WGA, with much of this increase offset elsewhere in net liabilities. These changes are discussed later in the chapter.

Table 2.3: Changes in WGA gross liabilities

	£ billion		
	2011-12 restated	2012-13	Difference
<b>Balance sheet levels at end March</b>			
Net public service pension liability	1,006	1,172	166
Government borrowing and financing <sup>1,2</sup>	966	996	31
Provisions	113	131	18
PFI liabilities (capital commitments)	36	37	1
Working capital (creditors and debtors) <sup>3</sup>	123	115	-8
Other financial liabilities <sup>4</sup>	374	443	69
<b>Total liabilities</b>	<b>2,618</b>	<b>2,893</b>	<b>276</b>

<sup>1</sup> These WGA liabilities are net of government borrowing and financing held as assets within the public sector. The amounts netted off include the gilts which are held by the Bank of England Asset Purchase Facility Fund (BEAPFF) as part of the Bank's quantitative easing programme (QE). The figures for these gilts held for QE are as follows:

	2011-12	2012-13	Difference
	308	392	84

These figures are the market value of the gilts held by the BEAPFF at the end of each year. At the end of 2011-12, the BEAPFF had borrowed £287 billion from the Bank of England, reflecting the purchase price of BEAPFF securities held. At the end of 2012-13, the BEAPFF had borrowed £375 billion, as the purchase price of its gilt holdings.

<sup>2</sup> In 2012-13, this borrowing includes £15 billion of 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.

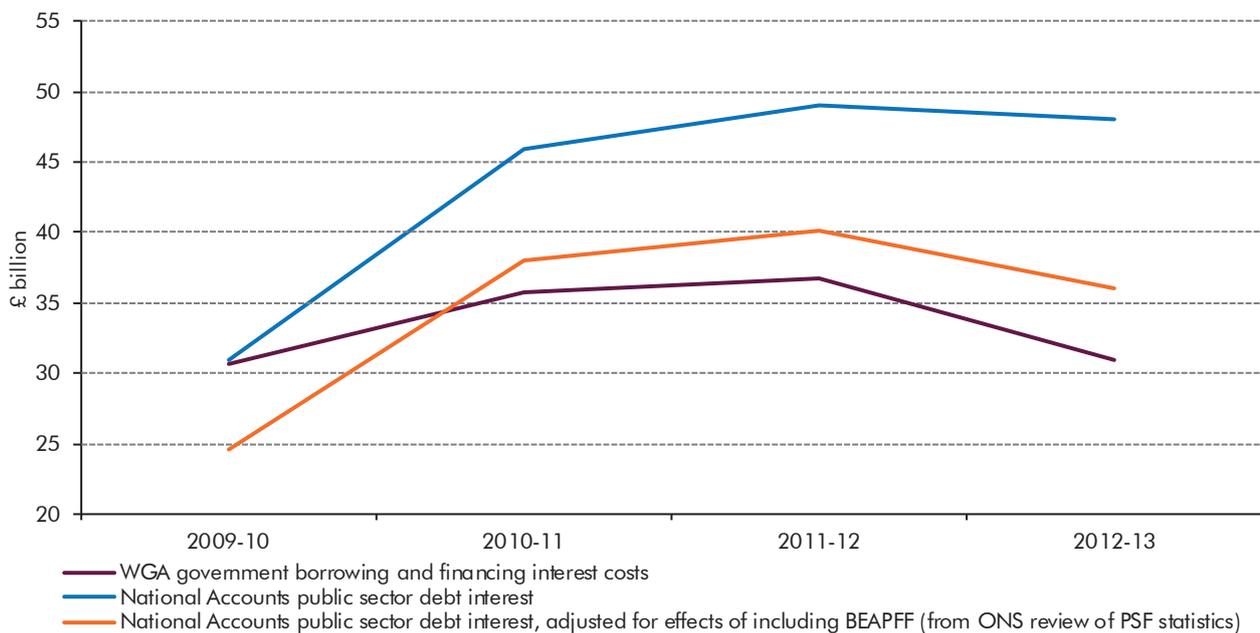
<sup>3</sup> Derived from total trade and other payables in the WGA account, excluding PFI liabilities.

<sup>4</sup> Includes deposits by banks outside the public sector (as defined by WGA) in the Bank of England, the Debt Management Office and the Exchange Equalisation Account. The figures for the deposits by banks in the Bank of England will include additional reserves created by the Bank to finance the BEAPFF's purchase of gilts.

2.31 The inclusion of the BEAPFF in the WGA means that the expansion of QE in 2012-13 in effect reduced net gilt issuance by the whole public sector from what would otherwise have been recorded.

2.32 Including QE and BEAPFF operations within the WGA means that debt interest costs are lower in the WGA than in the National Accounts because the interest rate on central bank reserves (Bank Rate) is lower than the interest rates paid on gilts. Chart 2.4 compares debt interest costs in the WGA with debt interest costs under the current definition of PSNB ex (which excludes the BEAPFF) and the future treatment in PSNB ex (which will include the BEAPFF). This demonstrates how the inclusion of the BEAPFF, and the reserves which finance its QE operations, reduces debt interest, as measured across the whole public sector. In 2012-13, the WGA measure of public sector debt interest was £17 billion lower than the current National Accounts measure, although this difference will reflect other measurement differences, as well as the reduction from including the BEAPFF and associated reserves.

Chart 2.4: WGA debt interest costs compared with the National Accounts



Source: ONS and WGA

2.33 At the beginning of 2012-13 the Government took on responsibility for both the Royal Mail Pension Plan (RMPP) deficit and the majority of the plan's liabilities, and, during 2012-13, the RMPP's £28 billion of assets were transferred to the Government. Before this, for instance in 2011-12, the RMPP was included in the WGA as a funded pension scheme, and the RMPP's net liabilities were therefore included in the WGA measure of the net pension liability, which is net of funded pension scheme assets.<sup>12</sup> In the 2012-13 WGA, the net pension liability has increased by £31 billion, to include the RMPP gross liabilities – this is explained in the section on the pension liability below. And the £28 billion of RMPP assets will have reduced the other net liabilities across the balance sheet. £11 billion of these assets were gilts, which were cancelled in 2012-13, which will have reduced the levels of liabilities for government borrowing and financing. Most of the remaining non-gilt assets were sold over 2012-13, which will have generated receipts and thereby reduced the government's liabilities.<sup>13</sup>

## Changes in WGA gross assets

2.34 Table 2.4 gives a breakdown of the changes in WGA assets over 2012-13. The total level of assets on the WGA balance sheet fell by £7 billion during 2012-13, and was £1,264 billion at end-March 2013. Table 2.4 shows that the fall reflected the net effect of various increases and decreases in assets, of which one of the largest was a £10 billion reduction in the levels of financial assets held by the Debt Management Office (DMO) and the Exchange

<sup>12</sup> Note 24 of the 2011-12 WGA recorded that the 'Other funded' balance included net pension liabilities for Royal Mail of £2.9 billion.

<sup>13</sup> In the National Accounts, before the Government legislated to take on Royal Mail's historic pension deficit with effect from April 2012, the RMPP was classified as in the private sector. See Box 4.1 in our March 2012 EFO for a full explanation of the effects on the public finances (as measured in the National Accounts), from transferring the RMPP deficit into the public sector.

Equalisation Account (EEA).<sup>14</sup> As noted above, the DMO's financial liabilities also fell by £7 billion over 2012-13. These movements in DMO and EEA financial assets and liabilities are not unusual in size, given their daily money market and foreign exchange operations.

- 2.35 The estimate for total public sector assets in WGA is significantly lower than the £1,591 billion National Accounts estimate of the combined assets of the general government and public corporations sectors at end 2012.<sup>15</sup> This reflects the fact that the WGA are fully consolidated across the public sector, and so exclude any government assets from investments in public corporations. The two accounting systems also have different assumptions for the rates at which assets are depreciated and the classification of specific assets.<sup>16</sup>
- 2.36 The £4 billion increase in the level of fixed assets reflects net additions (less sales), minus adjustments for depreciation, impairment and revaluations. This figure is substantially less than the £23 billion of public sector net investment (PSNI, excluding the effects of the Royal Mail transfer) recorded in the National Accounts for 2012-13. The majority of the difference is explained by the different accounting coverage of these two measures, for example PSNI includes capital grants, which are treated as current expenditure in the WGA. The WGA measure of fixed assets is also reduced each year by further impairments not included in PSNI, and adjusted for revaluations and reclassifications. But even the more comparable measures of gross fixed capital formation less asset sales in the National Accounts and net additions less sales in WGA follow different paths, with greater year-to-year volatility in the WGA measure.
- 2.37 In last year's FSR, we noted that the level of fixed assets increased in 2011-12 mainly because the 2011-12 WGA included some additional Academies that had been brought inside the WGA public sector boundary. The 2012-13 WGA has improved the quality of the data for Academies. The inclusion of additional Academies from outside the WGA boundary increased the level of fixed assets by around £3½ billion in 2011-12, and around £1 billion in 2012-13.
- 2.38 The values of the equity investments in the public sector banks in the 2012-13 WGA reflect the market prices of these assets at end-March 2013. These investments were valued at £45.2 billion, up £4.4 billion on the previous WGA. These equity assets include the Government's holdings in Royal Bank of Scotland (RBS), Lloyds Banking Group and UK Asset Resolution, which is the holding company for the Government's shares in Bradford and Bingley and NRAM. The changes in the values of these equity assets form one of the differences between the WGA and the National Accounts: in the WGA, the net liabilities change each year to reflect the latest market values for these assets, but in PSNB and PSND, changes in market price are not included until assets are sold and a profit or loss is realised.

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<sup>14</sup> 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.

<sup>15</sup> Non-financial assets from ONS (2013c); financial assets from ONS (2014b).

<sup>16</sup> The differences between the measures of assets in the two accounting systems were described in more detail in paragraphs 2.40 to 2.41 of the 2011 FSR.

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2.39 Table 2.4 shows a £4 billion reduction in the loans to banks and other financial service entities that were part of the Treasury's financial interventions. This reflects the repayment of £4 billion of these loans, so that the amount outstanding reduced to £44 billion at end-March 2013.

Table 2.4: Changes in WGA gross assets

	£ billion		
	2011-12 restated	2012-13	Difference
<b>Balance sheet levels at end March</b>			
Tangible and intangible fixed assets <sup>1</sup>	753	757	4
Equity investment in the public sector banks <sup>2</sup>	41	45	4
Student loans	33	36	3
PFI assets	39	37	-2
Working capital (creditors and debtors)	142	137	-5
Loans to banks and other financial service entities as part of HM Treasury's financial interventions <sup>3</sup>	48	44	-4
Other loans and deposits with banks <sup>4</sup>	74	67	-7
Other financial assets	96	96	0
Other assets <sup>5</sup>	45	44	-1
<b>Total assets</b>	<b>1,271</b>	<b>1,264</b>	<b>-7</b>

<sup>1</sup> Net of depreciation and impairment of assets. Excluding assets financed by PFI, which are shown separately.

<sup>2</sup> Includes the value of the government's investments in the Royal Bank of Scotland, Lloyds Banking Group, and UK Asset Resolution Ltd, which is the holding company for Northern Rock Asset Management plc and Bradford & Bingley plc.

<sup>3</sup> 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 loans and advances made to Bradford & Bingley and NRAM.

<sup>4</sup> Includes funds advanced to bank and central clearing counterparties under repo arrangements, as part of the operations of the Exchange Equalisation Account and Debt Management Office. Also includes deposits made by local government.

<sup>5</sup> Includes holdings of gold, cash and cash equivalents, inventories and assets for sale.

2.40 In 2013-14, the Government announced the sale of two tranches of Lloyds shares: the first in September 2013, which raised £3.2 billion, and the second in March 2014 (after we had published our *EFO*), which raised £4.2 billion. During 2013-14, the Government also raised £2.0 billion from the sale of its majority holding in Royal Mail. The income from each of these sales reduced PSND in 2013-14, and will similarly reduce net liabilities in the WGA for 2013-14.<sup>17</sup> However, the income will also reduce the WGA measure of net expenditure (i.e. the net deficit in the 2013-14 WGA), whereas sales of shares, for instance from privatisations, reduce net debt but do not reduce PSNB in the National Accounts.

2.41 The changes in assets in 2012-13 from student loans and PFI deals are discussed later in the chapter.

<sup>17</sup> Together these sales reduced the government holdings of shares in Lloyds Banking Group (LBG) from 39 per cent to 24.9 per cent. In April 2014, the ONS reviewed the classification of LBG and announced that, in the light of these sales of shares, it would be reclassified to the private sector with effect from March 2014. This reclassification will not affect the main fiscal aggregates that we use in the National Accounts, since we use 'ex' measures that exclude LBG. The WGA measures also currently exclude LBG.

## WGA aggregates over the past four years

2.42 The main WGA summary aggregates for the four years now available are shown in Table 2.5 below.

Table 2.5: Comparisons of WGA aggregates over four years

	Per cent of GDP <sup>1</sup>			
	2009-10 restated in 2010-11 WGA	2010-11 restated in 2011-12 WGA	2011-12 restated in 2012-13 WGA	2012-13
<b>Balance sheet levels at end of year:<sup>1</sup></b>				
Liabilities <sup>2</sup>	-169	-159	-169	-181
Assets	85	81	82	79
<b>Net liabilities<sup>1</sup></b>	<b>-84</b>	<b>-78</b>	<b>-87</b>	<b>-102</b>
<b>Flows during financial year:</b>				
Revenue	-40.7	-40.9	-39.9	-39.6
Direct expenditure	43.3	44.2	41.9	42.5
Impairments and other costs from revaluations <sup>2</sup>	3.3	-2.6	4.3	3.3
Net financing cost and other gains and losses <sup>3</sup>	5.5	5.6	5.6	5.2
<b>Net deficit</b>	<b>11.4</b>	<b>6.3</b>	<b>12.0</b>	<b>11.4</b>

<sup>1</sup> The balance sheet figures as a percentage of GDP use GDP centred at end-March

<sup>2</sup> The WGA future net pension liability was reduced by 8.4 per cent of GDP in 2010-11 to reflect the change to uprate future public service pension payments by CPI rather than RPI. This reduction was also included in the WGA net deficit as a cost from a revaluation of a liability.

<sup>3</sup> Net financing costs include interest on pension scheme liabilities. Other gains and losses includes the revaluation of financial assets and liabilities and net losses on disposal of assets.

2.43 As described above, it is difficult to compare WGA results across years. The previous year's accounts are partly restated, but this restatement does not cover the changes in discount rates or other examples of large changes which are shown in Figure 2.1 below. This means that, unlike the National Accounts, the WGA data are not designed to be comparable across multiple years.

2.44 Figure 2.1 illustrates how the basis of the WGA accounts changes each year, and how only the previous year's results are partly restated.

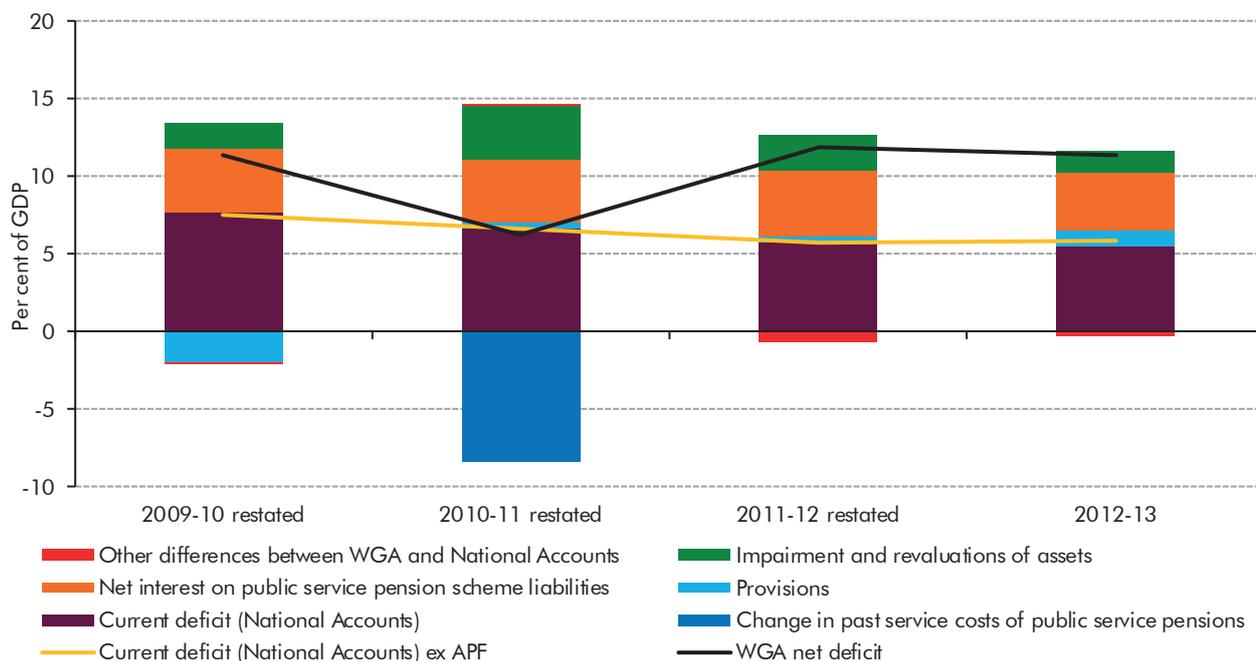
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Figure 2.1: Changes in the basis of the WGA results each year

	Year covered by WGA accounts				WGA accounts next year
	2009-10	2010-11	2011-12	2012-13	2013-14
<b>Changes with one previous year restated:</b>					
Boundary change	This was the first WGA publication, so no revisions to previous year	Boundary widened to include Bank of England and LCR. 2009-10 restated (minor changes)	None	None	Boundary will widen to include B&B and NRAM
Changes in accounting policies or corrections of errors	As above	2009-10 restated (minor changes)	2010-11 restated (minor changes)	2011-12 restated (minor changes)	Not known yet
<b>Changes without previous years restated:</b>					
Discount rates		Future pension liabilities re-estimated	Future pension liabilities re-estimated	Future pension liabilities and provisions re-estimated	Future pension liabilities re-estimated
Other changes		Change in pension uprating policy produced large fall in pension liability and net deficit	Impairment for losses not recorded in earlier years reduced value of investments		

- 2.45 The WGA also takes some net changes in the balance sheet valuations across to the expenditure flows, affecting the current year's deficit. The main example of such an effect in Table 2.5 is the impact of the public sector pension uprating policy change, which reduced the WGA net deficit by 8.4 per cent of GDP in 2010-11.
- 2.46 Chart 2.5 below compares the WGA net deficit with the National Accounts current deficit over the four years of the WGA results. The WGA net deficit was 11.4 per cent of GDP in 2012-13, unchanged from 2009-10, while the National Accounts current deficit shrank from 7.6 to 5.4 per cent of GDP (or 5.9 per cent of GDP, excluding APF transfers). Provisions are the main explanation for the different trends: they reduced the WGA net deficit by 1.9 per cent of GDP in 2009-10 (when a £25 billion provision related to the Asset Protection Scheme was reversed), but increased it by 1.0 per cent of GDP in 2012-13.

Chart 2.5: Differences between the WGA and National Accounts net current deficit



Source: 2012-13 WGA

## Differences between WGA and National Accounts aggregates

2.47 The public sector boundary differs from the WGA to the National Accounts, mainly because:

- the public sector in the National Accounts includes the Bank of England, but it does not include the BEAPFF. It also includes Bradford and Bingley and NRAM; whereas
- the public sector in the WGA includes the Bank of England *and* the BEAPFF, but it does not include Bradford and Bingley and NRAM.

2.48 In Box 2.1 of our 2013 *FSR*, we explained how these differences meant that the QE and the BEAPFF transactions featured differently in PSND and the WGA net liability. As we have seen when looking at the WGA liabilities in Table 2.3, the inclusion of the BEAPFF in the WGA reveals how QE operations have in effect replaced much gilt issuance with Bank of England reserves, and how this has reduced debt interest costs for the public sector as a whole.

2.49 The public sector boundaries in the WGA and National Accounts will become more closely aligned over the next couple of years:

- in 2013, the ONS conducted a review of its Public Sector Finances (PSF) statistics. One outcome is that the boundary used for PSND ex will be moved so that it will include the BEAPFF (but still exclude the public sector banks).<sup>18</sup> The ONS will move the monthly PSF statistics on to this new basis in September this year, when it will also implement

<sup>18</sup> ONS (2014a)

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ESA10 changes, and include Network Rail (which has been reclassified to the central government sector under ESA10); and

- the WGA boundary will be expanded in 2013-14 to include Bradford and Bingley and NRAM, and expanded further in 2014-15 to include Network Rail.

2.50 There may still be some differences, for instance if WGA still excludes further education institutions in Scotland, Wales and Northern Ireland.

2.51 Tables 2.6 and 2.7 show the reconciliation between the WGA and the National Accounts aggregates on the current definitions, as set out in the 2012-13 WGA results.<sup>19</sup> These tables start with the fiscal aggregates from the National Accounts, and then show the additional items included in the WGA aggregates. These tables also show how the values of the components of the reconciliation have changed between 2011-12 and 2012-13.

2.52 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 2012-13 WGA estimate of these additional liabilities is £1,172 billion (up from £1,006 billion in 2011-12), described below; and
- the inclusion of the public sector **tangible and intangible fixed assets** that are not included in PSND offsets £794 billion of these additional liabilities.

2.53 The large increase in the pension liability recorded in the 2012-13 WGA means that the WGA measure of net liability increased significantly more than PSND during 2012-13.

2.54 The WGA measure of net liabilities also includes additional future liabilities incurred to date for provisions and for PFI contracts, and it includes amounts owed to creditors and owing from debtors.

2.55 We have expanded Table 2.6 to include more of the detail now published in the 2012-13 WGA, for example the differences in the valuations of gilts and equity. The WGA revalue the net gilt liability each year to reflect the latest market prices, whereas, as we have seen earlier, PSND includes the nominal value of gilts issued. The WGA also revalue equities each year to reflect latest market values, but in PSNB and PSND the changes in market price are not included until the assets are sold and the profit or loss is realised.

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<sup>19</sup> The relationships between the two sets of aggregates are also described in Daffin and Hobbs (2011).

Table 2.6: Reconciliation of public sector net debt

	£ billion		
	Balance sheet levels at end March		
	2011-12 restated	2012-13	Difference
Public sector net debt (National Accounts)	1,106	1,185	79
Remove items included in PSND but not in WGA net liabilities:			
Bradford and Bingley and NRAM <sup>1</sup>	-83	-74	9
Add items included in WGA net liabilities but not in PSND:			
Net public service pensions liability	1,006	1,172	166
Provisions	113	131	18
Capital liabilities for PFI contracts	31	32	0
Tangible and intangible fixed assets	-793	-794	-1
Working capital (creditors and debtors)	-41	-40	1
Adjust for items measured differently:			
Gilts	23	31	8
Equity	-17	-23	-6
Other	1	10	9
<b>WGA net liabilities</b>	<b>1,347</b>	<b>1,630</b>	<b>282</b>

<sup>1</sup> This difference is effectively the net liabilities from the balance sheet of UK Asset Resolution (UKAR), which is the holding company for Bradford and Bingley and NRAM.

2.56 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 interest on the pension liability** in the balance sheet. This is an imputed flow, representing the interest costs of a future liability where the spending has not happened yet;
- the WGA net deficit includes additional impairments (**write-downs of assets**), and higher estimates of depreciation;
- the classification of **capital grants** and **net gains or losses on sales of assets**, which count as capital expenditure in the National Accounts but as current expenditure in WGA, and spending on **single-use military equipment**, which is current spending in the National Accounts but capital investment in WGA;
- the inclusion of **provisions** in the WGA (liabilities for the present value of future spending where the spending obligation was incurred as a result of past government activity), as distinct from a liability for spending to date as in the National Accounts; and
- the reconciliation table additionally shows the extent to which the interest payments are reduced in WGA, because of the WGA's inclusion of the BEAPFF, as discussed in paragraph 2.32 above. In 2012-13 this difference is lessened by the APF transfers, which currently reduce the current deficit in the National Accounts.

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Table 2.7: Reconciliation of public sector current deficit

	£ billion		
	2011-12 restated	2012-13	Difference
<b>Current deficit (National Accounts)</b>	<b>89</b>	<b>85</b>	<b>-4</b>
<b>Remove items included in National Accounts current deficit but not in WGA net deficit:</b>			
Bradford and Bingley and NRAM	1	0	-1
Military expenditure not capitalised	-6	-6	0
<b>Plus additional items included in WGA net deficit:</b>			0
Net interest on public service pension scheme liabilities	65	59	-6
Impairment and revaluations of assets	35	21	-14
Capital grants	15	12	-3
Net changes in provisions	6	16	11
Net gains/losses on sale of assets	0	3	3
<b>Adjust for items measured differently:</b>			
Depreciation	4	5	1
Other differences between public service pension charges (WGA) and pensions paid (in the National Accounts)	-12	-10	2
APF transactions	-9	-6	3
Other	-2	-1	1
<b>Net deficit for the year (WGA)</b>	<b>185</b>	<b>179</b>	<b>-6</b>

## Additional information on future liabilities

2.57 The following sections look at the latest information available from the 2012-13 WGA on levels of future liabilities incurred from past activities. We start by looking at student loans. Although these are assets rather than liabilities, there is an expectation that a proportion of loans will be written off over time. WGA contains useful information on expected levels of future write-offs. In Annex B, we explore the potential impact of student loans on fiscal sustainability in more detail. The chapter then looks at each area of WGA information on future liabilities.

2.58 We also look at the Government's main 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. It is useful to keep track of these announcements to ensure that we cover any risks to our assessment of fiscal sustainability from these potential liabilities crystallising.

### Student loans

2.59 Government loans to students appear as assets in the WGA, while the borrowing to finance them appears as a liability. 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.

2.60 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 the 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 costs when the spending happens.

Table 2.8: Changes to student loan assets

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

2.61 Table 2.8 shows that the WGA estimate of student loan assets increased by £2.9 billion in 2012-13, to £36.0 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 £9.1 billion. Actual repayments on previous loans reduced the assets by £1.9 billion.

2.62 Changes to impairments on new and existing loans were £4.2 billion. This includes:

- impairments for future costs of write-offs on new loans issued, 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 forecasts.

2.63 The WGA figures, which reflect the underlying numbers in the BIS and devolved administrations' 2012-13 accounts, reflect the long-term forecasts in *FSR 2012*, and so do not reflect our latest economic projections. Annex B shows the latest BIS numbers for 2013-14. The WGA figures also do not include the impact of loans that the Government would expect to make to future students. In Chapter 3, we take these factors into account when

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considering the impact of student loans on our long-term fiscal projections. Annex B considers the sensitivity of these projections to different assumptions.

### Net liabilities of public service pensions

- 2.64 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 future employment, so the 2012-13 balance sheet does not cover future pension costs for public service employment after March 2013.
- 2.65 The latest WGA results show that net public service pension liabilities increased by £166 billion in 2012-13, from £1,006 billion (65 per cent of GDP) at the beginning of the year to £1,172 billion (73 per cent of GDP) at the end of the year. This covers the liabilities of both unfunded and funded schemes.
- 2.66 Table 2.9 below shows the main factors that contributed to the change in the net pension liability over the four years from 2009-10 to 2012-13. Three of these factors had a particular effect that raised the pension liability in 2012-13:
- the discount rate used to convert the expected future pension payments into a one-off upfront sum (which is based on high quality corporate bond yields) has been reduced by 0.4 percentage points, increasing the net pension liability by up to £57 billion.<sup>20</sup> (The lower the discount rate, the higher the present value of the future cash payments and the liability.) Table 2.10 below shows the discount rates used by the central government unfunded pension schemes in their accounts from 2008-09 through to 2013-14.<sup>21</sup> This shows the discount rate that will be used by the central government pension schemes in 2013-14;
  - corrections to previous assumptions increased the net pension liability by £40 billion. These corrections adjust the assumptions used in previous estimates of the future liabilities, if the actual outturn data for these assumptions are different. These assumptions are inherently uncertain and therefore can show significant movements from year to year, as shown in Table 2.9; and
  - during 2012-13, the transfers from the funded Royal Mail Pension Plan (RMPP) to the new unfunded Royal Mail Statutory Pension Scheme (RMSPS), increased the net pension liability by £28 billion. This apparent increase only reflects the transfer of the RMPP's £28 billion of assets to elsewhere on the balance sheet. Previously, these assets were netted off the net pension liability, which is net of the assets held by the funded pension schemes.

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<sup>20</sup> £57 billion is the total for changes in a range of assumptions which include mortality rates, salary increases and the discount rate. But the change in the discount rate will account for most of this change.

<sup>21</sup> The discount rates are set in the Government Financial Reporting Manual (FRM), 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 pension. In June 2010, the Government changed the indexation used to uprate public service pensions from the RPI to the CPI, from April 2011.

2.67 Table 2.9 also shows how the net pension liability increases each year to reflect the additional future pension costs from the current year's employment, and how it reduces by the extent of the actual pensions paid out each year. The change in the level of the additional future pension costs each year will reflect the changes in the number of staff employed, but it is more heavily influenced by adjustments that are included each year to adjust the previous year's future costs for the previous year's change in discount rates.<sup>22</sup> This means, for instance, 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 2013-14.

Table 2.9: Changes to net liabilities of public service pensions

	£ billion			
	2009-10 restated	2010-11 restated	2011-12 restated	2012-13
Net pension liability at 1 April	802	1,135	961	1,006
Net pension liability at 31 March	1,135	961	1,006	1,172
<b>Change</b>	<b>333</b>	<b>-174</b>	<b>45</b>	<b>166</b>
<i>Of which:</i>				
Future pension costs for staff employed in current year <sup>1</sup>	28	40	35	35
Changes in assumptions underlying the value of future liabilities, including the change in the real discount rate	258	-69	10	57
Change in past service costs <sup>2</sup>	1	-126	1	0
Transfers in/out <sup>3</sup>	-	0	2	27
Corrections to assumptions to reflect actual outturn data	29	-31	-12	40
Pensions paid for the unfunded pension schemes <sup>4</sup>	-27	-29	-31	-35
Other changes <sup>5</sup>	45	41	40	41

<sup>1</sup> 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.

<sup>2</sup> 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.

<sup>3</sup> 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).

<sup>4</sup> In 2012-13, this additionally includes pensions paid for the new Royal Mail Statutory Pension.

<sup>5</sup> Includes interest on pension schemes' liabilities less expected return on pension schemes' assets, less employee contributions for the funded pension schemes. For 2009-10 to 1011-12, this also includes the restatement.

<sup>22</sup> These adjustments are needed 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, which is the discount rate from the previous year.

Table 2.10: Discount rates for central government pension schemes

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

- 2.68 The 2012-13 WGA results include the first of the increases in employee pension contributions to the public service pension schemes that were announced in Spending Review 2010, and which are being phased in over three years, from 2012-13 to 2014-15. These increased contributions will only have a minor effect on the net pension liability, because this only includes the pension contributions for the funded schemes.<sup>23</sup> The employee contributions for the unfunded schemes are recorded separately as income – in the same way as, say, National Insurance contributions – that reduces the WGA net liability and the level of government borrowing and financing on the WGA balance sheet. The 2012-13 WGA records that, within ‘other revenue’, the income from public sector employees’ pension contributions increased by £0.9 billion in 2012-13, to £6.5 billion. This will reflect changes in staffing levels as well as the effects of this policy measure. In our November 2011 *EFO*, we forecast that this policy measure would raise additional income of £1.2 billion in 2012-13, rising to £2.8 billion in 2014-15.
- 2.69 The net pension liability as reported in the 2012-13 WGA does not yet reflect the larger changes to the unfunded public service pension schemes that are being introduced from 2015-16 onwards, as a result of the Hutton reforms.<sup>24</sup> These reforms will mainly begin to affect pensions for staff retiring from 2025-26 onwards, with the effects building up with length of service under the new pension schemes. However, these future effects will be reflected in the WGA estimates of future pension costs as the pension scheme revaluations become available. These are being agreed and published in stages during 2014-15, so that we might expect the effects to start to be reflected in the WGA covering 2015-16. In our 2012 *FSR*, we estimated that these reforms would reduce spending by about a further 0.1 per cent of GDP.
- 2.70 In our 2012 *FSR*, we included details of the new ONS experimental statistics that cover the whole of the UK’s pension liabilities, including private sector pensions, state pensions, and public service pensions.<sup>25</sup> Although the ONS has not yet issued any update to those statistics, it has released a paper that explains how the treatment of the UK pension liabilities will change, later this year, under ESA10. The main points are explained in the following box.

<sup>23</sup> In the 2012-13 WGA, the pension contributions from the unfunded schemes for 2012-13 were lower than in 2011-12, but this mainly reflected the transfers from the funded RMPP to the unfunded RMSPS. However the increases in employee contributions are not being implemented in the Local Government Pension Schemes, which are the largest funded pension schemes.

<sup>24</sup> Independent Public Service Pensions Commission (2011)

<sup>25</sup> Levy (2012)

## Box 2.1: The treatment of pension liabilities in the National Accounts

In 2012, the ONS published new experimental statistics on the total gross liabilities of UK pension providers. These liabilities covered all sectors of the UK economy, including private and public sector pensions, and state pensions. And the liabilities covered all pension schemes, whether funded or unfunded, defined benefit (DB) or defined contribution (DC) schemes. Under ESA10, from 2017, all European Member States are required to submit statistics to Eurostat on most of these liabilities.<sup>a</sup>

In the National Accounts, ESA10 changes the arrangements for funded DB pension schemes, so that the net liabilities of these schemes for the future costs incurred from past activities are calculated using commercial accounting concepts. In summary, the new treatment has the main effects that:

- for private sector funded DB schemes, household saving, employers' social contributions and the investment income payable on pension entitlements are increased, reflecting the increase in the estimated net present value of future pensions incurred to date;<sup>b</sup> and
- for public sector funded DB schemes – the Local Government pension schemes – there is also an increase in employers' social contributions in any period, to cover any increase in the net liability of the scheme in that period, i.e. the extent to which the net increase in liabilities is not covered by the net increase in assets.

The relevance for the WGA is that:

- the Pension Protection Fund (PPF) was established to pay compensation to members of eligible DB pension schemes, when there is a qualifying insolvency event in relation to the employer and where there are insufficient assets in the pension scheme to cover PPF levels of compensation;
- the PPF is not currently included within the WGA, but the 2012-13 WGA states that the Treasury propose to include it in the 2013-14 WGA. We will need to see then how the WGA balance sheet covers PPF liabilities related to private sector DB funded pension schemes, and the offsetting PPF assets; and
- the change in treatment for the Local Government pension schemes will mean that they will be treated very similarly in both the National Accounts and the WGA.

In the National Accounts, the PPF is classified to the public sector, but the ONS has not yet included the effects of its transactions in the public sector finances. When the ONS brings these effects in, we would expect them to have a neutral effect on PSNB and PSND.

<sup>a</sup> The information on pension liabilities which Member States are required to submit to Eurostat does not include individual personal pensions.

<sup>b</sup> Employers' social contributions include actual social contributions and imputed social contributions. Further details are available in Jones, Robbie (ONS) (2014).

## The Private Finance Initiative

- 2.71 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.
- 2.72 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.
- 2.73 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 balance sheet of whichever entity the accountants judge to have effective control of it.
- 2.74 As at March 2013, PSND included £5.1 billion (0.3 per cent of GDP) in respect of the capital costs of PFI deals that were recorded as on balance sheet in the National Accounts. This estimate is based on previous liabilities but may be revised once ONS has sourced the latest departmental data on PFI deals, and considered the classification of the commitments arising from the new Private Finance Two (PF2) contracts.<sup>26</sup> As we mentioned in paragraph 2.13 above, ONS will also be producing information for Eurostat at the end of this year on PFI deals that are regarded as off balance sheet in the National Accounts.
- 2.75 Based on the classification approach used for WGA, Table 2.11 shows the latest figures recorded on the WGA balance sheets for PFI assets and capital liabilities. This shows that the future liability estimated for capital amounts payable at end-March 2013 was £36.6 billion, up by £0.5 billion from end-March 2012. This is a smaller increase than seen 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 £37.0 billion at end-March 2013, down by £1.7 billion from end-March 2012. The value of assets will have fallen because the existing PFI assets are revalued and depreciated every year; over 2012-13, the reductions from revaluations and depreciation were larger than the net additions from any new PFI deals.
- 2.76 As well as the liability for future capital PFI payments recorded on the WGA balance sheet, the WGA also contain details of the present value of obligations for future PFI payments, which cover service and interest payments as well as capital costs. These are also shown in Table 2.11. (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, but not sufficiently certain to be included on the balance sheet.) These associated

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<sup>26</sup> 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).

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 associated interest and service costs become relatively firm long-term obligations, and they therefore have the potential to reduce the flexibility for other spending in the future.

- 2.77 The Treasury also publishes the results of a separate data collection exercise each year, which currently covers all PFI projects funded by central government. These results show which of these projects would be on or off the balance sheet using the International Financial Reporting Standards used by 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 2013 cover PFI deals signed up to end-March 2013.<sup>27</sup> These show that, if no further deals were signed, annual 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 deals are spread across the public sector and will be included in Departmental Expenditure Limits, and the budgets of individual NHS trusts, local authorities and public corporations.
- 2.78 These separate data published by HM Treasury suggest that the information for the future liabilities that are 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 £38 billion or 2.4 per cent of GDP. This implies that, if all capital spending under PFI was to have been carried out through conventional debt financing, PSND would have been 2.0 per cent of GDP higher at end-March 2013. This difference is little changed from last year.

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<sup>27</sup> HM Treasury (2013a,b,c).

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Table 2.11: WGA PFI data

	£ billion			
	2009-10	2010-11	2011-12	2012-13
<b>WGA data for PFI deals on balance sheet:<sup>1</sup></b>				
<b>Figures from the Statement of Financial Position (balance sheet):</b>				
Net book value of PFI assets	30.9	34.9	38.7	37.0
Liability for future capital payments	28.1	32.0	36.1	36.6
<b>Present value of obligations for future payments</b>	<b>164.9</b>	<b>183.6</b>	<b>191.7</b>	<b>198.8</b>
<i>Of which:</i>				
Capital payments <sup>2</sup>	34.1	35.1	38.0	39.3
Interest payments	33.4	39.0	42.3	42.2
Service charges	97.4	109.5	111.4	117.3
HM Treasury data for percentage of PFI deals on balance sheet (IFRS basis) (per cent) <sup>3</sup>	-	89%	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)	-	2.4%	2.4%	2.4%

<sup>1</sup> On balance sheet on IFRS basis at end of financial year. Figures for 2009-10 to 2011-12 are as restated in following year's WGA.

<sup>2</sup> The obligations for future capital payments include additional costs such as contingent rents and lifecycle replacement costs.

<sup>3</sup> 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.

2.79 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. We show that information in Table 2.12.

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

	2010-11	2011-12	2012-13
	restated	restated	
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 <sup>1,2</sup>	183.6	191.7	198.8
<i>Of which, obligations arising:</i>			
Within one year	9.0	9.3	10.5
Later than one year, but within next five years	34.1	36.1	37.4
Later than five years	140.6	146.2	150.8
<i>And of which, obligations by sector:</i>			
Central government (including NHS)	110.2	114.7	121.9
Local authorities	69.6	72.9	72.8
Public corporations	3.9	4.2	4.1

<sup>1</sup> The obligations for future capital payments include additional costs such as contingent rents and lifecycle replacement costs.

<sup>2</sup> 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.

## New Treasury control total for PFI spending

- 2.80 The Government announced at Autumn Statement 2012 that it would introduce a control total for the commitments arising from off balance sheet Private Finance Two (PF2) contracts. The Government has now given further details of how the new control total will work. It will include all existing PFI and PF2 contracts funded by central government, whether on or off the WGA balance sheet. It will apply from 2015-16 onwards. The control will be a limit of £70 billion in nominal terms, which will apply over the five-year period from 2015-16 to 2019-20. This will cover all payments in respect of these PFI contracts, including payments to cover capital, interest and service costs. The Government has said that their performance against this control total will be assessed at each Budget.
- 2.81 The Treasury data published in December 2013 showed total cumulative spending from 2015-16 to 2019-20 for payments on all PFI contracts funded by central government of £51 billion. This covered PFI deals that will be subject to the control total, for PFI deals signed by end-March 2013. This update included 15 additional projects that were signed during 2012-13, which increased the total spending over the control total period by £1.2 billion. This update implies substantial headroom below the new £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.
- 2.82 The Treasury also publishes separate data on PFI projects currently in procurement, which are relevant to the £19 billion headroom against the control total. These currently show:
- 22 projects in procurement at end-March 2013, with an estimated capital value of £3.5 billion;
  - five further batches of projects under the PF2 Priority Schools Building Programme, which are due to deliver £700 million of private finance and reach financial close by summer 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

- 2.83 The WGA net liabilities include other non-PFI-related finance leases that are similarly off balance sheet in the National Accounts. These carried a further capital commitment of £5.3 billion at end-March 2013, unchanged from the previous year.
- 2.84 The WGA also includes various other financial commitments, which – like the obligations recorded for the payments of interest and service costs for PFI deals shown above – are not on the WGA balance sheet. These financial commitments are definitely expected to be incurred. However, they are not recognised as future liabilities or regarded as provisions in the WGA because the obligation to record the liability is not incurred until the associated capital asset or service is realised. The present values of future payments for these financial

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commitments are shown in Table 2.13 below. These include interest payments on finance leases, overall payments on operating leases, and payments on capital and other contracts.

Table 2.13: Future payments for other financial commitments

	£ billion	
	2011-12 restated	2012-13
<b>On balance sheet in WGA - included in net liabilities</b>		
<b>Finance leases: capital payments</b>	<b>5.3</b>	<b>5.3</b>
<b>Off balance sheet in WGA - not included in net liabilities</b>		
<b>Finance leases: interest payments</b>	<b>19.8</b>	<b>19.8</b>
<b>Operating leases</b>	<b>20.9</b>	<b>21.0</b>
<b>Contracted capital commitments:</b>	<b>37.7</b>	<b>37.7</b>
<i>of which:</i>		
MOD commitments for property, plant and equipment, and for intangible fixed assets	16.6	16.7
TfL contracts for transport and infrastructure projects	4.2	3.7
NHS and DH capital and IT contracts	2.2	2.6
Other capital contracts <sup>1</sup>	14.7	14.7
<b>Other non-cancellable contracts:</b>	<b>61.8</b>	<b>49.3</b>
<i>of which:</i>		
Working capital facility for Bradford & Bingley and NRAM	6.0	7.2
Higher education grants	7.5	6.3
Payments to Network Rail and train operating companies	10.4	6.0
NHS contracts, including the NHS national IT programme	5.1	4.6
HM Treasury bilateral loan to Ireland	2.0	0.8
BBC outsourcing, programme acquisitions and rights	3.6	3.5
Engineering and Physical Sciences Research Council grants	1.8	2.1
DEFRA buildings, IT services and waste infrastructure projects	2.4	2.3
Other <sup>1</sup>	23.0	16.5

<sup>1</sup> Other contracts, none of which are significant in size for the WGA.

## Provisions

- 2.85** 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.
- 2.86** New provisions increase the total of net liabilities recorded on the WGA balance sheet. These provisions for future liabilities 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. This is, therefore, largely a timing difference between the two sets of accounts.

- 2.87 Since the provisions record the liability for fiscal costs that are expected to happen in the future, the WGA information on provisions should be reflected in our forecasts. We discuss the main provisions below, and explain where the relevant fiscal cost is in our forecast. Many of the provisions extend beyond the medium term, so these will carry fiscal costs for the long-term projections as well as our medium-term *EFO* forecasts.
- 2.88 Table 2.14 gives a summary breakdown of the main provisions recorded in WGA. The largest are for future nuclear decommissioning and clinical negligence costs. Total liabilities for provisions increased by a net £18 billion in 2012-13. These net changes included an increase of £33 billion for re-estimated and new provisions, offset by a reduction of £13 billion for provisions which were used during the year (roughly matching the amount that was expected to be used this year in last year's WGA). £6 billion of previous provisions were also removed because they were no longer judged to be likely to happen.
- 2.89 The additions to provisions in 2012-13 included two particular increases for reasons not seen in previous WGA results. The largest was a reduction in the short and medium-term discount rates used to calculate central government provisions. This increased total provisions by about £5 billion. These discount rates had not changed since 2005, and the Treasury have now revised the methodology for setting them so that the short and medium term rates will be reviewed each year. The rates are based on the real yields on index-linked gilts, which were negative across much of the yield curve in 2012-13. Real yields used in previous years' WGA were positive at 2.2 per cent.
- 2.90 The second novel increase was a change in HMRC's treatment of potential future losses of taxes from oil and gas field decommissioning, where legislation allows the costs of this decommissioning to be set off against profits chargeable to petroleum revenue tax and ring-fence corporation tax. In their accounts for 2011-12, HMRC increased their contingent liabilities for these decommissioning costs from £5 billion to £20 billion, to reflect additional future liabilities for losses of corporation tax and petroleum revenue tax, but they did not include any provisions for any of these oil and gas field decommissioning liabilities. In their 2012-13 accounts, HMRC have changed their treatment to include a new provision of £3.8 billion for the taxes that they expect to be lost due to the costs of oil and gas field decommissioning over the next five years, up until 2017-18. They have not included any contingent liabilities for the remaining potential losses in future periods after that, because they no longer consider them quantifiable. As we will see below, this has reduced the WGA estimate of quantifiable contingent liabilities by £20 billion.<sup>28</sup>
- 2.91 Our medium-term forecasts and long-term projections for oil and gas revenues have always included estimates of the effect of decommissioning costs. So HMRC's change in treatment is aligned with our medium-term forecast. We project decommissioning costs through to 2040-41, based on industry estimates, and details are included in the supplementary tables for this *FSR* on our website.

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<sup>28</sup> This HMRC change in treatment of their provisions and contingent liabilities for oil and gas field decommissioning was set out in Table 2.18 of our 2013 *FSR*.

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Table 2.14: Provisions in the WGA

	£ billion		
	2011-12 restated	2012-13	Difference
<b>Future liability covered by provision:</b>			
Nuclear decommissioning	63.8	69.8	6.0
Clinical negligence	19.4	24.0	4.6
Taxes subject to legal challenge	2.1	4.2	2.1
Oil and gas field decommissioning <sup>1</sup>	-	3.8	3.8
Financial Assistance Scheme	3.9	4.0	0.1
Equitable Life payments scheme	1.3	0.9	-0.4
Department of Health (NHS)	3.0	3.7	0.7
DECC (reprocessing contracts and Coal Authority)	3.3	3.4	0.1
Other provisions	16.2	17.0	0.8
<b>Total provisions</b>	<b>113.0</b>	<b>130.7</b>	<b>17.7</b>

<sup>1</sup> In 2011-12, HMRC included £20 billion contingent liabilities in their accounts for oil and gas field decommissioning. However in 2012-13 they changed their treatment of these potential liabilities so that £3.8 billion were recorded as provisions.

- 2.92 Table 2.14 shows that the largest provisions in the 2012-13 WGA were for nuclear decommissioning and clinical negligence, where the expected future costs are implicitly included in our forecasts for Resource Departmental Expenditure Limits (RDEL). This means that the future RDEL allocations are required to provide for these future costs.
- 2.93 In 2012-13, the provision for nuclear decommissioning increased by £6.0 billion to £69.8 billion, although £3.8 billion of the increase was reported to stem from revisions to discount rates. The future liabilities are inherently uncertain and therefore highly likely to be significantly different from the estimated provision.
- 2.94 Provisions for clinical negligence also increased by £4.6 billion in 2012-13, to £24.0 billion. This is a much larger increase than reported in the WGA in the previous three years, when this provision increased by an average of £1.8 billion, or 12 per cent a year. These provisions are clearly on a rising trend. There are two factors underlying this year's larger increase: the first is a 28 per cent increase in the part of this provision that covers likely future pay-outs for incidents that have happened during 2012-13, but where no claim has been received yet; second, as already mentioned, is the reduction in the discount rate, which increased this provision by £1.2 billion.
- 2.95 The payments for clinical negligence cover legal costs as well as the payments of damages. The NHS Litigation Authority 2012-13 accounts show that the legal costs accounted for about a third of total pay-outs.<sup>29</sup>
- 2.96 The provisions listed in Table 2.14 above include HMRC provisions for legal disputes over taxes, discussed in paragraph 2.104 below. The provisions also include:

<sup>29</sup> See NHS LA (2013), Figure 4 and p.21.

- £4.0 billion relating to DWP's Financial Assistance Scheme (FAS), which preceded the introduction of the Pension Protection Fund;
- £3.7 billion relating to the Department of Health's NHS provisions, which cover UK citizens' medical costs incurred in other European countries, injury benefits and various future support or payments to patients and Trusts' staff;
- £3.4 billion relating to DECC's provisions to cover any funding shortfall on long term nuclear reprocessing contracts, obligations in respect of the Coal Authority's ownership of old coal mines, and obligations to provide solid fuel or a cash alternative to ex-miners and their dependents formerly employed by British Coal;
- £0.9 billion for HM Treasury provisions for the Equitable Life Payments Scheme; and
- other provisions, including those covering injury benefits, criminal injuries compensation, legal aid and various compensation claims in relation to transport schemes or termination of employment.

2.97 Table 2.15 below shows when the provisions at end-March 2012 and end-March 2013 were expected to be used. This shows that the amount of provisions that are expected to be used within five years has increased by a further £12 billion, compared with the results from the 2011-12 WGA. This increase will add to the pressures on departments' spending limits, which our medium-term forecast shows are set to fall substantially relative to GDP.

Table 2.15: Timing of use of WGA provisions

Provisions used in financial year £ billion	Provisions at end March, £ billion				Total level of provisions
	Future time period when provisions expected to be used				
	Within next year	Within 5 years	After 5 years		
2011-12 restated	11.7	13.4	27.4	72.2	113.0
2012-13	12.7	12.5	39.3	78.9	130.7

## Contingent liabilities

2.98 The notes to the WGA record various contingent liabilities, where the chances of the costs arising are judged to be less than 50 per cent. These are not included in the WGA main financial statements or the summary aggregates. The contingent liabilities are sub-divided into quantifiable and unquantifiable contingent liabilities. There is also a separate category of 'remote' contingent liabilities, where the chances of the costs arising are judged to be near zero.

2.99 If any quantifiable contingent liabilities crystallised or looked more likely than not to do so, this would reduce the level of contingent liabilities as they would instead be recorded as an increase in spending or provisions. However, as we have seen with the example of oil field decommissioning in paragraph 2.90 above, previous data on risks can also simply be reassessed in each year's accounts and treated differently.

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- 2.100 Assuming that we agree with the accountants on whether the events identified as risks are expected to happen or not, 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 cover contingent liabilities, as they have a less than 50/50 chance of crystallising, so would not appear in a central forecast. However, contingent liabilities are still fiscal risks, and we therefore need to consider them when assessing fiscal sustainability, and consider the circumstances in which these liabilities could be triggered.
- 2.101 Table 2.16 shows the latest figures for quantifiable contingent liabilities in the 2012-13 WGA, and how these estimates have changed since the 2011-12 WGA. In 2012-13, the overall level of contingent liabilities fell by £13 billion, to £88 billion. This fall was more than accounted for by the removal of the contingent liability for oil and gas field decommissioning, as explained above. Other contingent liabilities increased, for instance for export credit guarantees and for clinical negligence.
- 2.102 We noted in our December 2013 *EFO* that the Treasury had announced that UK Export Finance's (UKEF's) gross exposure to losses on its guarantees and insurance policies is to be expanded from £25 billion to £50 billion. This forms an upper limit on UKEF's provisions and contingent liabilities.<sup>30</sup>
- 2.103 Table 2.16 shows that the WGA continue to include around £10 billion in quantifiable contingent liabilities for financial stability interventions. This mainly covers the Government's liability for the contingent capital it has made available for RBS. The facility was originally set in place for five years, to end in December 2014, but was ended by RBS a year early in 2013-14 with the consent of the Financial Services Authority. Therefore we expect that this contingent liability will be extinguished in the Treasury's accounts for 2013-14 and in the 2013-14 WGA.

Table 2.16: WGA quantifiable contingent liabilities

	£ billion		
	2011-12 restated	2012-13	Difference
Financial Stability interventions	9.9	9.9	0.0
Export guarantees and insurance policies	9.9	12.7	2.8
Clinical negligence	8.4	10.5	2.1
Taxes subject to challenge	14.5	14.5	0.0
Supporting international organisations	32.6	32.1	-0.5
Oil and gas field decommissioning revenues	20.0	0.0	-20.0
Other	5.5	8.2	2.7
<b>Total quantifiable contingent liabilities</b>	<b>100.8</b>	<b>87.9</b>	<b>-12.9</b>

- 2.104 HMRC include both provisions and contingent liabilities in their accounts to cover litigation risks related to taxes they have collected. The provisions cover cases which they see a

<sup>30</sup> In our *EFOs* (from December 2013 onwards), we list any changes to future contingent liabilities as a result of new policy announcements since the last *EFO*, as reported to us by the Treasury. At end-March 2013, UKEF had a provision for £0.5 billion of export guarantees and insurance policies, which is included in 'Other provisions' in Table 2.14 above.

serious risk of losing, while the contingent liabilities cover the amount of tax at risk in cases that they see a good chance of winning. In the 2012-13 WGA, the provision increased back to £4.2 billion, which was close to the £4.4 billion level at end-March 2011, having fallen to £2.1 billion at end-March 2012. The contingent liability was unchanged at £14.5 billion. In their 2013-14 Trust Statement, HMRC have increased the provision to £5.4 billion, and they have doubled the contingent liability to £29.2 billion.<sup>31</sup> This reflects possible outcomes on all the cases that are currently subject to litigation, and payments that might stretch out some way into the future. 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.

## Non-quantifiable contingent liabilities

- 2.105 Table 2.17 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 2012-13 WGA only include one new significant non-quantifiable contingent liability, which relates to access to life insurance for Ministry of Defence personnel. And one significant non-quantifiable contingent liability has been removed: following the sale of Northern Rock in January 2012, the Treasury quantified the contingent liabilities under the warranties associated with this sale as £310 million, and this is included as a remote contingent liability in the 12-13 WGA.
- 2.106 Given HMRC's change in treatment of the risk for future tax losses from oil and gas field decommissioning (explained in paragraph 2.90), we expected that their accounts would include a non-quantifiable contingent liability for these risks beyond 2017-18. However, while the accounts explain the main uncertainties in these future costs and state that, given these uncertainties, it is not possible to provide a reliable estimate of the tax costs of decommissioning beyond 2018-19, they are not disclosed as a non-quantifiable contingent liability.

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<sup>31</sup> HMRC decide on the likely outcome to assume for accounting purposes on a case by case basis, following accounting guidelines. The higher ratio of contingent liabilities to provisions reflects the average case size in the contingent liability category having increased relative to the average case size in the provision category.

Table 2.17: Non-quantifiable contingent liabilities in the 2012-13 WGA

Details of the most significant non-quantifiable contingent liabilities in the 2012-13 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.
- Compensation schemes set up by HM Treasury in relation to former shareholders of various banks taken into public sector ownership as part of the financial stability interventions.
- 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 liabilities arising from rail franchise agreements.
- 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

- 2.107 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.
- 2.108 The 2012-13 WGA show that the quantifiable remote contingent liabilities almost halved during the year, reducing by a net £77 billion to stand at £85 billion at end-March 2013. The reduction reflected two financial intervention-related potential liabilities being extinguished during the year, the Credit Guarantee Scheme and the Asset Protection Scheme. Both schemes closed at the end of October 2012, with no pay-outs. These schemes had both, correctly in hindsight, been classified as remote contingent liabilities, because the risk of pay-outs was judged to be very small.

### New contingent liabilities and guarantees from recent policy announcements

- 2.109 This section brings together the Government's main recent policy announcements that are expected to give rise to 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. It is useful to 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.
- 2.110 Table 2.18 below shows the Government schemes that have been announced since March 2012 and are expected to give rise to additional future liabilities of this sort. This table excludes the Funding for Lending (FLS) scheme, which the Bank of England and HM Treasury launched in July 2012. This scheme is now reflected in the WGA, as shown in Table 2.3 above. However, since this scheme involves exchanges of assets between the Bank of England and other banks, it has a neutral effect on the balance sheet. The table also excludes the Contracts for Difference (CFDs) that are being introduced by the

Department for Energy and Climate Change (DECC) in 2014-15 as part of the Electricity Market Reform programme. The 2012-13 WGA noted that these CFDs may give rise to financial derivative liabilities on DECC's balance sheet. However, while these CFDs will represent a future liability, the payments from the public sector as a result of CFDs will be exactly equal to income from the levy on licensed electricity suppliers. Therefore the CFDs should not affect the overall balance sheet.

2.111 Table 2.18 includes the UK Guarantees Scheme, which is one scheme amongst the several others that are involved in the Government's plans to encourage diverse sources of private finance in UK infrastructure. The other various schemes are listed in the finance update document for the National Infrastructure Plan, which the Treasury issued in March, including, for instance, the Green Investment Bank (GIB) and the Pensions Infrastructure Platform.<sup>32</sup> We have discussed these other schemes with the Treasury and they have assured us that, although the GIB is wholly owned by the Government, it operates as an arm's length commercial organisation, receives no guarantee from the Exchequer, and does not issue any guarantees that are significant in the context of Table 2.18. The Treasury have also told us that there are no contingent liabilities related to the other funding avenues listed in the National Infrastructure Programme, and the Government has not issued any guarantees with respect to them.

2.112 While the precise accounting treatment of these various measures will not be known until future years' WGA are published, it is possible to think through some of the broad implications for fiscal sustainability now. Most importantly, while each measure in isolation could well be considered a remote contingent liability, the probabilities of the various liabilities crystallising are likely to be 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.

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<sup>32</sup> HM Treasury (2014b)

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Table 2.18: Schemes with future liabilities announced after March 2012

Scheme	Limit (cap)	Date scheme announced	Period scheme operates	Extent scheme operating	In 2012-13 or 2013-14 accounts?	Resource accounts
Housing Guarantee Scheme <sup>1</sup>	£10 billion	September 2012	June 2013 to December 2016	£634 million approved, £208 million drawn down	Will be 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 2014: £153 million	In 2013-14 accounts	HMT
Help to Buy: equity loan	£9.7 billion	Mar-13	April 2013 to March 2020	Operational	In 2013-14 accounts	DCLG
Export Refinancing Facility	£5 billion <sup>2</sup>	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 <sup>3</sup>	The £1.25 billion was announced at Autumn Statement 2012 and Autumn Statement 2013	2014 onwards	A request for proposals to pilot the scheme was issued alongside Budget 2014	Expected to commence in 2014-15	BIS
UK Guarantees Scheme	£40 billion of contingent liabilities	July 2012	October 2012 to December 2016	4 Guarantees signed: 1) Drax Power: £75 million 2) Sustainable Development Capital: £8.8 million 3) Northern Line Extension: £750 million 4) Mersey Gateway Bridge: £257 million  44 projects currently prequalified with capital value of around £35 billion <sup>4</sup>	In 2013-14 accounts	HMT

<sup>1</sup> Includes Private Rented Sector and Affordable Housing guarantees.

<sup>2</sup> 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.

<sup>3</sup> 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.

<sup>4</sup> 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.

Note: In our 2013 FSR, this table additionally included Lending to PPPs, which was announced in July 2013. This scheme ended in July 2013 without being used, and so is not included now.

## Conclusion

2.113 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:

- PSND increased by 3.0 per cent of GDP in 2012-13, reaching 74.2 per cent of GDP by end-March 2013. In the March 2014 *EFO*, we forecast that it would rise to 78.7 per cent of GDP in 2015-16, before falling thereafter. We have revised our medium-term PSND forecast down over the past year;
- the WGA demonstrate that the gilts purchased by the Bank of England's Asset Purchase Facility during 2012-13 replaced government gilt issuance with Bank of England reserves on the liabilities side of the balance sheet. This has reduced public sector borrowing costs;
- the WGA measure of net debt rose more sharply than PSND in 2012-13. This was partly because the WGA liabilities include public service pensions, which rose by 16 per cent or £166 billion, due in large part to a lower discount rate. The WGA also include PFI capital costs (little changed at £37 billion) and provisions (up by £18 billion, a 16 per cent increase, due to higher expected costs of future nuclear decommissioning and clinical negligence settlements, and more likely costs of future oil and gas field decommissioning). Contingent liabilities in the WGA fell by £13 billion, or 13 per cent, largely because of the reclassification of future oil and gas field decommissioning costs out of this category;
- while the reassessment of the balance sheet in each year's WGA means that the results are difficult to compare across years, it is notable that the WGA and National Accounts deficit measures tell different stories over the past four years. In particular, the WGA net deficit remained unchanged at 11.4 per cent of GDP between 2009-10 and 2012-13, whereas the National Accounts current deficit fell by 2.2 per cent of GDP over this period (or 1.7 per cent of GDP excluding the APF transfers). The WGA presents a different picture because its net deficit includes the movement in provisions, which increased by 2.9 per cent of GDP over this period; and
- the WGA illustrate how the composition of future fiscal risks is slowly changing. Risks from some of the financial interventions are receding as schemes are closed (e.g. the Credit Guarantee Scheme and Asset Protection Scheme) and loans are repaid. But other quantified risks are rising, particularly on nuclear decommissioning and clinical negligence, where more of these risks are now expected to materialise in the period from 2014-15 to 2017-18. For health in particular this presents another pressure on departmental budgets that will, as described in Chapter 3, come under demographic pressures in the coming years.

2.114 These measures of the public sector balance sheet provide a useful snapshot of the fiscal impact of past government activity. But they are of limited use in assessing fiscal

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sustainability: neither measure includes the expected impact of future government activity, notably future spending and future tax raising. We turn to this in the next chapter.

# 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 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 2018-19 that we published in the March 2014 *Economic and fiscal outlook (EFO)*, so as to focus on longer-term influences rather than 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 2019-20. All tax escalators to end by 2018-19.
Departmental spending	Spending by function is consistent with the latest spending review plans out to 2015-16. Implied real spending cuts in the three years to 2018-19 are distributed evenly across departments. Grown in line with nominal GDP from 2019-20 onwards, apart from items subject to demographic pressures.
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 in payment.
Other benefits (e.g. working age benefits)	All working age benefits uprated with earnings from 2019-20. Universal credit will be fully available in each part of Great Britain during 2016 with the majority of the remaining legacy caseload moving during 2016 and 2017.
Student loans	Policy parameters (e.g. cap on tuition fees and repayment threshold) uprated in line with earnings from 2019-20. 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 by blanket 3.2 per cent; 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 Government has made a number of policy announcements, including:

- pencilling in further spending cuts in 2018-19 in Autumn Statement 2013 and setting out other medium-term tax and spending measures in that Autumn Statement and in Budget 2014;
- further guidance on the future path of the State Pension age, based on changes in life expectancy; and
- its intention to sell the pre-2012 student loan book from 2015-16 and to remove the cap on student numbers by that year.

The projected longer-term impacts of these policies are discussed in more detail below.

## 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.<sup>1</sup>
- 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 (see Table 3.3). The latest central projections imply 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 in 2063 is projected to have reached 100, while the population would contain more than 1 million people aged over 100.

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			
	Legislated	Population variant		
		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

- 3.9 Another pensions-related policy development since our last FSR was the Budget 2014 announcement of greater flexibility around access to pension assets. The potential impact of this measure is discussed in Box 3.1.

<sup>1</sup> For further detail on the Government's announcement, see DWP (2013a).

### Box 3.1: Pension flexibility and the long-term public finances

At Budget 2014, the Government announced a number of tax measures that increase the flexibility with which individuals can access their defined contribution (DC) pension assets. The current system allows some flexibility for individuals with small or very large pots, but others are subject to a 55 per cent withdrawal tax and most still buy an annuity. From April 2015, everyone with a DC pension pot will be able to withdraw their funds as they choose, from the age of 55, subject to their marginal rate of income tax at the time.

In our March *EFO*, we noted that offering more flexible access to pension pots was likely to affect the composition of households' financial and non-financial assets. Some people may redirect funds from annuities into other financial assets or housing. Some may increase their pension saving temporarily to benefit from tax-free lump sum withdrawals. Some may use their funds to increase their consumption, although we judged that this effect was likely to be small. In the *EFO*, we highlighted the fact that the size of these effects are very uncertain, but we concluded that the principal impact of the change would be on the composition of household assets, rather than on the aggregate flow of saving or spending.

This box considers two possible sensitivities around our March judgement that have been the subject of public interest. Specifically, we consider: first, the possibility that there will be more money flowing into the housing market; and second, that people may spend their pension pots relatively early in retirement, leading to greater reliance on income-related benefits.

#### **What if pension flexibility leads to significant amounts money flowing into the housing market?**

The IFS estimated the size and characteristics of the population affected by the pensions flexibility measure in a recent report.<sup>a</sup> It found that around 40 per cent of individuals aged 55 to 59 have some money in a DC pension, and a quarter of these are already able to draw down funds ahead of retirement because they have sufficiently high income or a sufficiently small pot. As such, 30 per cent (around a million people), with average DC assets of around £180,000, are estimated to acquire new flexibility as a result of the measure.<sup>b</sup>

There is no way of knowing how much extra money will be invested in housing given the new pension flexibility, particularly over the projection horizon of this report. Other investments, including annuities, may become more attractive as financial conditions normalise. And the greater flexibility may also mean other would-be investors in the housing market will choose pension saving instead. The amount of money flowing into housing might also be more than the capital deployed from pension pots, if it were leveraged through mortgage borrowing.

But for illustrative purposes, we can consider what the effect on house prices and the public finances might be if the entire annual flow of new annuity business, estimated by the Treasury to be around £11 billion a year,<sup>c</sup> was to be diverted into housing. This is an extreme illustration, as it includes the whole population of retirees. But assuming a one-for-one impact on house prices, no housing supply response and commensurate growth in DC pension pots, this would add ¼ percentage point to house price inflation every year. A simple fiscal ready-reckoner suggests this would add a relatively small £25 million to £50 million a year to our receipts forecast.<sup>d</sup> Even cumulated over 50 years, the effect would only remain around 0.1 per cent of GDP.

If the effect on house prices was matched in rents, there could be offsetting effects from higher spending on housing benefit and lower VAT receipts as a higher proportion of consumer spending went on housing costs that are not subject to VAT.

### What if people spend their pension pots too quickly and need support from the state?

Some commentators have argued that the new flexibility could result in a greater proportion of people using their pension pot for short-term consumption, perhaps because they discount the future too heavily (i.e. they place a greater weight on enjoying a Lamborghini today than on living comfortably in, say, 10 years' time). More pensioners might therefore become dependent on income-related benefits in the future.<sup>e</sup> People may also simply underestimate their cohort life expectancy and may exhaust their pension pot, causing them to fall back on state support.<sup>f</sup> Depending on what this extra consumer spending purchased, it could boost VAT receipts. But as this would bring forward the use of pension assets, rather than increasing them, that would be a temporary timing effect rather than a lasting boost to receipts.

To the extent that pension pots were exhausted more quickly, the main fiscal impact on the spending side would be likely to come from the housing-related elements of income-related benefits, notably housing benefit and council tax support, rather than pension credit, the straightforward income support for pensioners. Eligibility for housing-related benefits extends further up the income distribution than it does for pension credit, especially following the removal of the savings credit element of pension credit as part of the single-tier pension reforms. Our central projections do not assume greater recourse to income-related pensioner benefits as a result of myopic or misjudged use of pension pots. But the sensitivity is modest: by way of illustration, we project that spending on these income-related benefits for pensioners will amount to around ¼ per cent of GDP in 2063-64, so even a 5 per cent rise in caseloads would increase spending and the primary deficit by only 0.01 per cent of GDP in that year.

<sup>a</sup> Emmerson *et al* (2014)

<sup>b</sup> Population affected calculated using ONS 2012 population statistics and the IFS estimate of the proportion affected.

<sup>c</sup> HM Treasury (2014c)

<sup>d</sup> OBR (2012)

<sup>e</sup> Emmerson (2014)

<sup>f</sup> Crawford and Tetlow (2012)

## Expenditure on public services

- 3.10 For public services such as health and education, we assume an underlying real increase in expenditure per capita of 2.2 per cent a year from 2019-20 onwards. This implies that spending per person rises in line with average earnings and so remains flat as a share of actual GDP, absent changes in the demographic profile. 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 rising or falling as a share of GDP.
- 3.11 The starting point for demographically-driven spending is an important assumption for our long-term projections. The Government has set out detailed spending plans to 2015-16, with total spending thereafter determined by an aggregate spending assumption that determines an implied amount that could be spent by departments, but not how that amount would be allocated across departments. We base our projections on the functional

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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 2018-19 are distributed evenly across all departmental spending. We test the sensitivity of our projections to this assumption later in the chapter.

- 3.12 From our assumed 2018-19 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

- 3.13 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’, and is discussed in more detail in Box 3.2. It would not be realistic to assume that this would be allowed to continue indefinitely. 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.
- 3.14 A similar issue arises on the spending side – uprating working-age benefits with prices rather than average incomes 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.

#### Box 3.2: Fiscal drag and price uprating

We have updated last year’s analysis of fiscal drag on income tax and NICs liabilities between 2019-20 and 2033-34. The analysis is based on the latest Survey of Personal Incomes, our latest long-term economic assumptions and the effect of measures announced over the past year such as the increase in the personal allowance. Table A shows that by 2033-34 fiscal drag would increase tax revenues by 2.1 per cent of GDP if tax thresholds and allowances were raised in line with inflation. As was the case last year:

- around half comes from people moving into paying tax and some taxpayers paying a higher proportion of their income at the basic rate;
- around a third comes from taxpayers moving into the higher rate band, and people paying the higher rate on a larger proportion of their income; and
- the remaining portion comes from the additional rate threshold and the personal allowance taper. The medium-term assumption is that these are fixed in cash terms, so there is fiscal drag relative to CPI inflation on top of the normal fiscal drag relative to incomes.

The effect on NICs is much smaller, as the marginal rate for employee NICs falls to 2 per cent on earnings above the upper earnings limit. Continued fiscal drag would therefore lead to lower receipts from employee NICs, offset by higher employer NICs where there is no upper limit.

**Table A: Effect of fiscal drag on income tax and NICs receipts by 2033-34**

	Overall	Allowances	Basic rate limit	Higher rate limit	
				price effect	real effect
Income tax (£ billion)	83.4	41.5	24.6	9.9	7.5
Income tax (per cent of GDP)	2.1	1.0	0.6	0.2	0.2
	Overall		Individual		Employer
NICs (£ billion)	10.4		-2.0		12.4
NICs (per cent of GDP)	0.3		0.0		0.3

Our long-term assumptions for uprating pensioner benefits are similar to the current medium-term policy settings. In both cases the basic state pension is subject to the ‘triple lock’ (rising by the maximum of earnings, prices or 2.5 per cent a year), and pension credit is uprated with earnings. The second state pension is uprated by CPI in payment, but earnings in accruals. The single-tier pension is legislated to rise at least in line with earnings. For the purposes of these projections, we assume it is also subject to the ‘triple lock’, which raises spending by 0.2 per cent of GDP by 2033-34.

Over the medium term, other smaller pension benefits and non-pension benefits to pensioners, including disability benefits, are due to be raised in line with inflation. If we assumed that this remained the case over the longer term then these would be 0.3 per cent of GDP lower in 2033-34 than under our central assumption that they rise in line with earnings.

Nearly all working-age benefits are due to be uprated by CPI in the final year of our medium-term forecast. Maintaining this over the longer term would reduce spending on these benefits by 1.3 per cent of GDP in 2033-34 relative to our central assumption of earnings uprating.

## 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. Changes in these assumptions cumulated over a period of decades can make a big difference to the future size and composition of the population, with implications for the public finances. As we discuss in Box 3.3, past experience illustrates the scale of uncertainty around each of these individual assumptions. We therefore test the sensitivity of our projections to alternative population projections later in the chapter.

### Box 3.3: The evolution of population projections since 1955

Population projections are subject to significant uncertainty, particularly over very long time horizons. That is why population projections cannot be treated as precise forecasts. This box reviews the sources of errors in past official projections.<sup>a</sup>

Chart A below shows how the principal population projections have evolved over recent decades. The UK population has typically risen by more than projected. The only exception was the 1965-based projection, which assumed that the high fertility rate of the early 1960s baby boom would continue. Since errors in the underlying assumptions cumulate over time, the errors on total population can be large. The 1955-based projections under-estimated the population 25 years ahead by almost 3 million. The 1965-based projections over-estimated it by 9½ million at the same horizon. What can explain these large differences?

As with any forecast or projection, including economic forecasts, there are a couple of important sources of error:

- first, failure to spot turning points, as projections typically assume a similar rate of growth to that in recent data. Net migration and fertility are cases in point (Chart B and C). The official population projections did not anticipate either the fall in the total fertility rate in the 1990s (perhaps related to postponement of child bearing) or the subsequent pick-up in the 2000s (which may reflect more young migrants than anticipated, who go on to raise families).<sup>b</sup> Net inward migration has typically been under-estimated, as it has risen in recent decades whereas projections have usually assumed it would be flat. In 2013, net inward migration totalled 212,000, well above the principal variant in the ONS's 2012-based projections – let alone the low migration variant used in our central projection; and
- second, difficulty in determining underlying structural trends. Most obviously, population projections have consistently under-estimated the trend rise in longevity, leading to persistent over-estimates of the number of deaths (Chart D). For example, the 1975-based projections under-estimated the 60+ population in 2011 by 2.6 million. Some earlier population projections also assumed that the total fertility rate would rise back to the replacement level of 2.1. The rate has not in fact risen that far in recent decades, as people have continued to postpone child-bearing (Chart C).

Chart A: Total population<sup>1</sup>

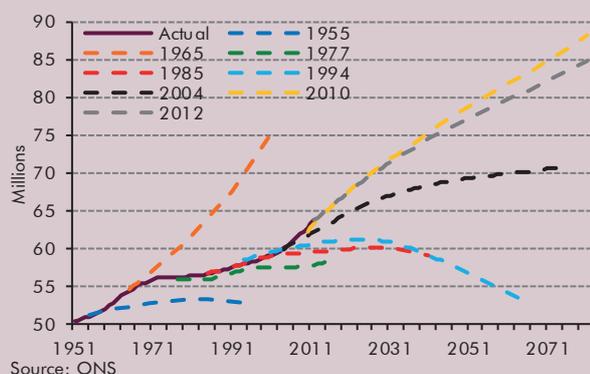


Chart B: Net migration

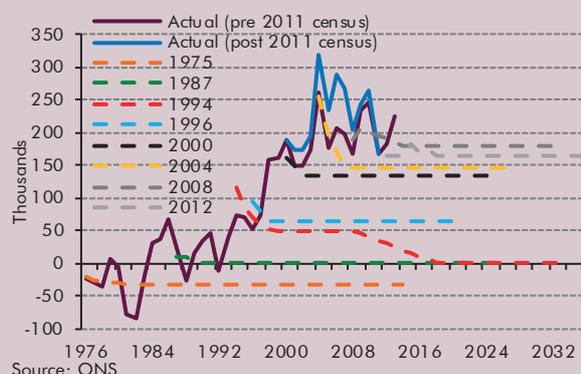


Chart C: Total fertility rate

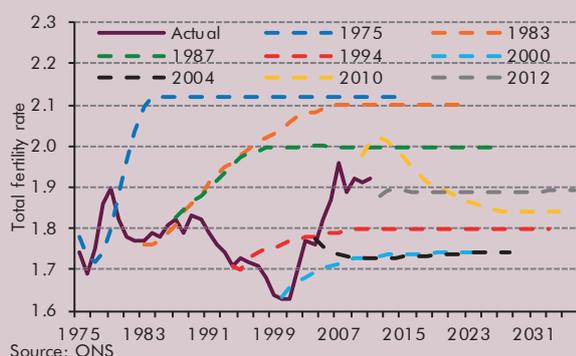
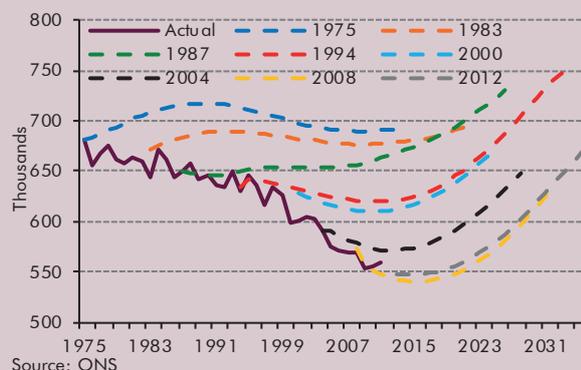


Chart D: Deaths



<sup>1</sup> The years in each legend refer to the population projections that were produced on the basis of that year's estimate: e.g. '2012' refers to the 2012-based population estimates that were produced by the ONS in November 2013.

The table below breaks down the errors in successive population growth projections to 2011 into their underlying sources: over/under-estimation of births, deaths, net migration and other factors (primarily errors in estimates of the base population at the time the projection was made). The figures are presented in terms of annual population growth from the year of the projection to 2011 – and are thus comparable across projections. The total error is more than 100,000 per year for every projection in the table and the biggest source of error in most was net migration. In the earlier projections, there were also large but offsetting errors in births and deaths (which were both over-estimated). Subsequently, all factors have contributed to higher than expected population growth. In the most recent projections, the main source of error arose from the upward revision of the base population estimate in the 2011 census.

Table B: Error in projected UK population growth to 2011 by component

Population projection	Difference between projected and actual annual population growth to 2011 (thousands)				
	Total population	Contribution to total population error			
		Births	Deaths	Net migration	Other factors
1977-based	163	-59	87	137	-2
1983-based	187	-20	69	154	-16
1985-based	149	-22	41	149	-19
1987-based	135	-32	44	142	-19
1992-based	101	-3	18	121	-35
1994-based	164	42	35	135	-48
1996-based	157	39	37	138	-57
2000-based	121	73	39	96	-87
2004-based	199	82	15	92	10
2006-based	105	11	0	27	67
2008-based	212	29	-3	30	156
2010-based	550	-15	5	-32	592

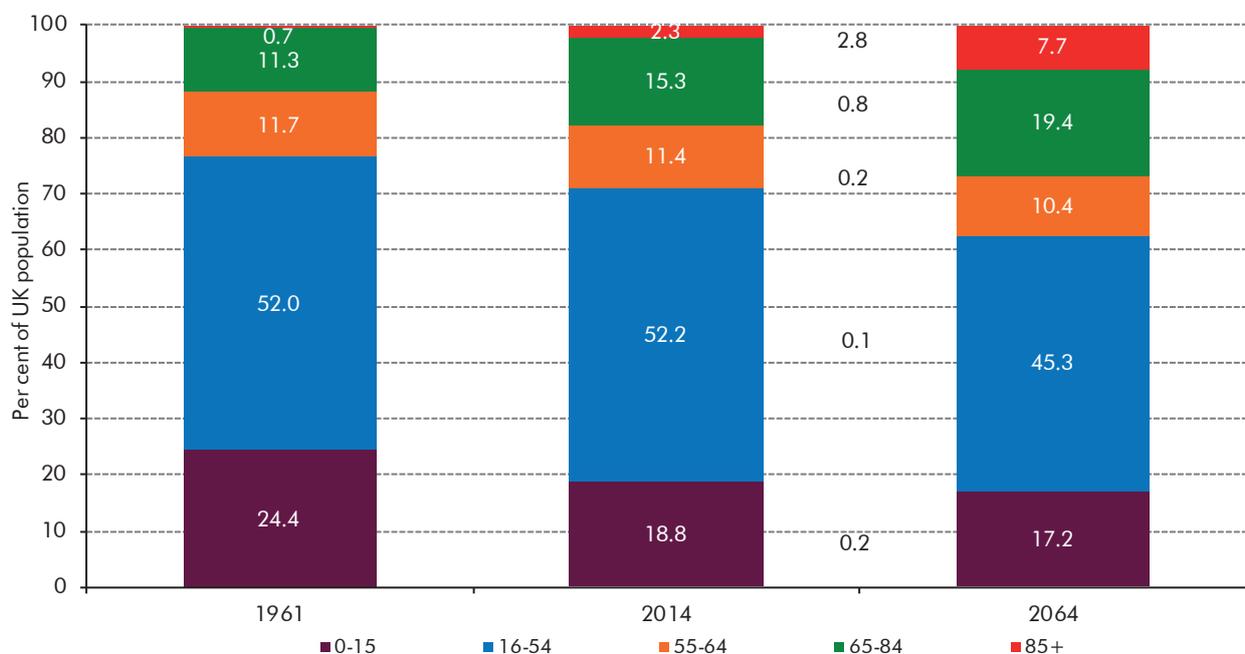
The obvious conclusion to draw is that population projections are subject to much uncertainty, which is why we present our long-term fiscal projections based on a number of different variants of the population projections. It is just as important to understand the implications of different population projections as it is to consider the message from the central projection.

<sup>a</sup> Shaw (2007) <sup>b</sup> Dunnell (2007)

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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 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 over 85 compared to growth in other age bands. It is this ageing of the population that has the greatest impact on the future outlook 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.

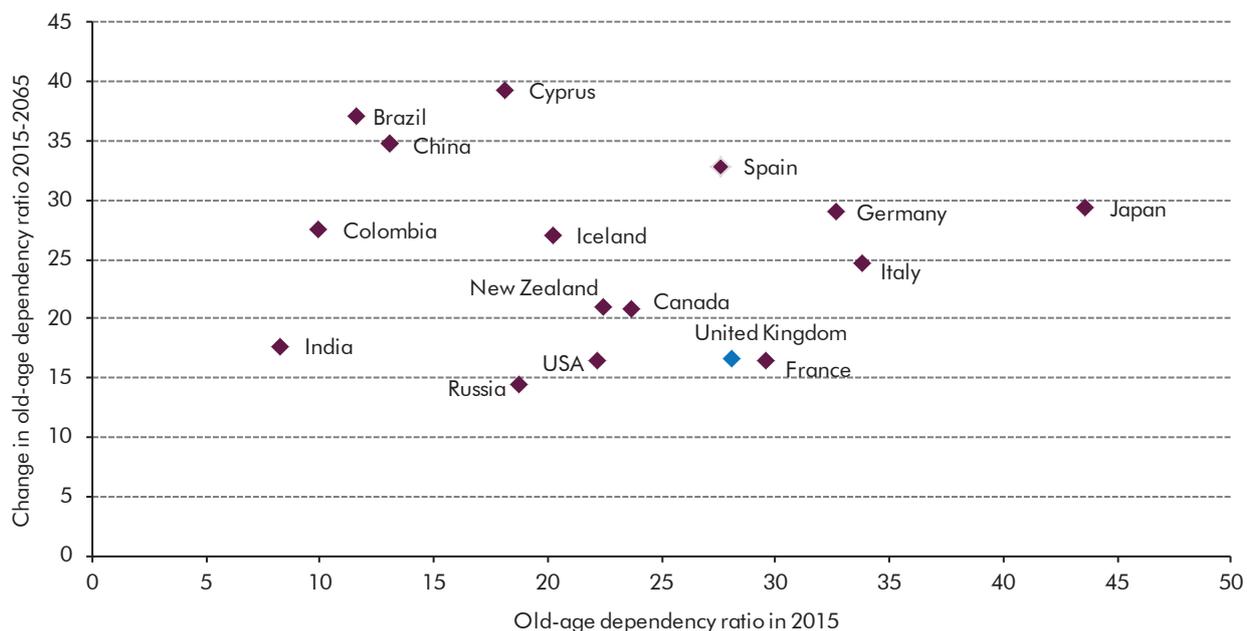
Chart 3.1: Population structure in 1961, 2014 and 2064



1961 is England and Wales only. Figures within columns are proportions; figures between columns are average annual growth rates. 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 per hundred aged between 15 and 64, for various countries, derived from UN population projections. The chart shows that a number of countries currently have higher dependency ratios than the UK and/or are projected to see those ratios rise more quickly over the coming 50 years.

Chart 3.2: UN projections of the old-age dependency ratio



Source: UN Population Division

- 3.18 Since our last report, the ONS has produced new population projections based on 2012 population data, which take into account the 2011 census. The census found around half a million more people than previously estimated in the UK, with more people of working age, especially women of childbearing age, and fewer people aged 75 and over.
- 3.19 In our central projections we use the ONS ‘low migration’ population variant, which we consider reasonable given international trends and the direction of Government policy – although, as Box 3.3 illustrated, there is considerable uncertainty around this assumption. The ONS has revised down the rate of long-run net inward migration for this variant from 140,000 a year to 105,000. The age composition of these net flows has also changed slightly. The bulk of net inward flows remain people aged in their twenties, but the latest projections now show net outflows for people in their late thirties and early forties, rather than for those aged 50 and above as in the previous projections. These changes in effect imply that inward migrants will spend a smaller proportion of their working lives in the UK than in the previous projections.
- 3.20 Fertility rates have been revised down over the recent past, in light of the census data, and are now projected to remain roughly flat. The total fertility rate settles at 1.89 children per woman. This profile is below the 2010-based projections out to mid-2020, but above the previous long-term assumption of 1.84 children. Projected life expectancy levels are broadly unchanged.
- 3.21 Table 3.3 summarises the latest long-term assumptions for the population variants of interest to us. Table 3.4 highlights the changes since the previous set of projections. Chart 3.3 shows what the latest low migration projections imply for the population structure 50 years ahead, relative to the 2010-based projections. Lower long-term net migration and

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lower fertility rates in the recent past and near future, reduce the projected number of people aged between their mid-twenties and mid-fifties. In contrast the projected number of people aged 80 and over has been increased by the findings of the latest census. Relative to last year's projections, in absolute terms we expect to have more old people, fewer working age people and the same number of young people, which means that the working age population is smaller relative to the non-working age population. As we shall see, this means that the projected population structure is now somewhat less favourable to the public finances.

3.22 Table 3.3 contains an additional variant compared with last year. Ministers have expressed an ambition to reduce net inward migration to 'tens of thousands' a year and Home Office business plans since May 2010 have also included policies that it claims will achieve this. So this year we look at an additional population variant labelled 'high tens of thousands', which assumes that long-term net migration settles (for illustration) at 90,000 a year.

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 2064 (millions)	
		Males	Females		16-65	Total
OBR central <sup>1</sup>	1.89	84.0	87.3	105	43.2	76.2
High migration	1.89	84.0	87.3	225	48.8	84.6
Long-term balanced	1.89	84.0	87.3	0	39.3	71.1
High tens of thousands	1.89	84.0	87.3	90	42.6	75.3
Young age structure	2.09	81.9	85.5	225	51.8	87.1
Old age structure	1.69	86.2	89.1	105	40.4	74.2

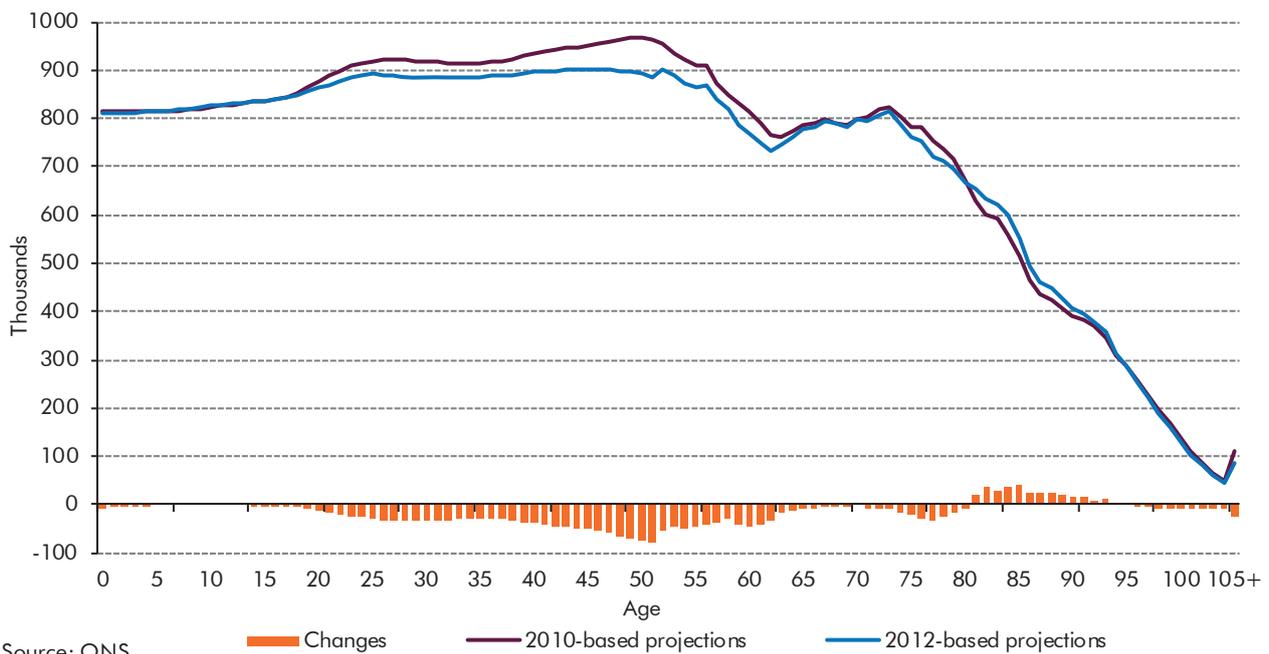
<sup>1</sup> Equivalent to the ONS's 'low migration' population variant.

Table 3.4: Changes in population variant assumptions since the 2010-based projections

	Fertility rate	Life expectancy at birth in 2037 (years)		Long-term average annual net migration (thousands)	Size of population in 2064 (millions)	
		Males	Females		16-65	Total
OBR central <sup>1</sup>	0.05	0.4	0.1	-35	-1.8	-1.7
High migration	0.05	0.4	0.1	-35	-2.3	-2.8
Long-term balanced	0.05	0.4	0.1	0	-0.3	-0.2
High tens of thousands	-	-	-	-	-	-
Young age structure	0.05	0.9	0.0	-35	-2.4	-3.0
Old age structure	0.05	-0.1	0.1	-35	-0.8	-0.7

<sup>1</sup> Equivalent to the ONS's 'low migration' population variant.

Chart 3.3: Population projections for 2064



Source: ONS

Changes      2010-based projections      2012-based projections

### Economic assumptions in the long-term projections

- 3.23** 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 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.
- 3.24** Table 3.5 lists the underlying long-term assumptions used in our projections, which are unchanged from last year’s FSR. Our latest medium-term economic forecast shows the gap between actual and potential output closing in mid-2018, and we assume the output gap remains closed throughout the long-term projection period. 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.
- 3.25** In last year’s report, when our medium-term forecast showed a negative output gap at the end of the forecast period, we projected further years of above-trend growth in order for the output gap to close in 2020-21. As this is no longer necessary, the long-term assumptions are now applied from 2019-20 onwards (with the exception of interest rates), whereas last year they were applied from 2021-22 onwards.

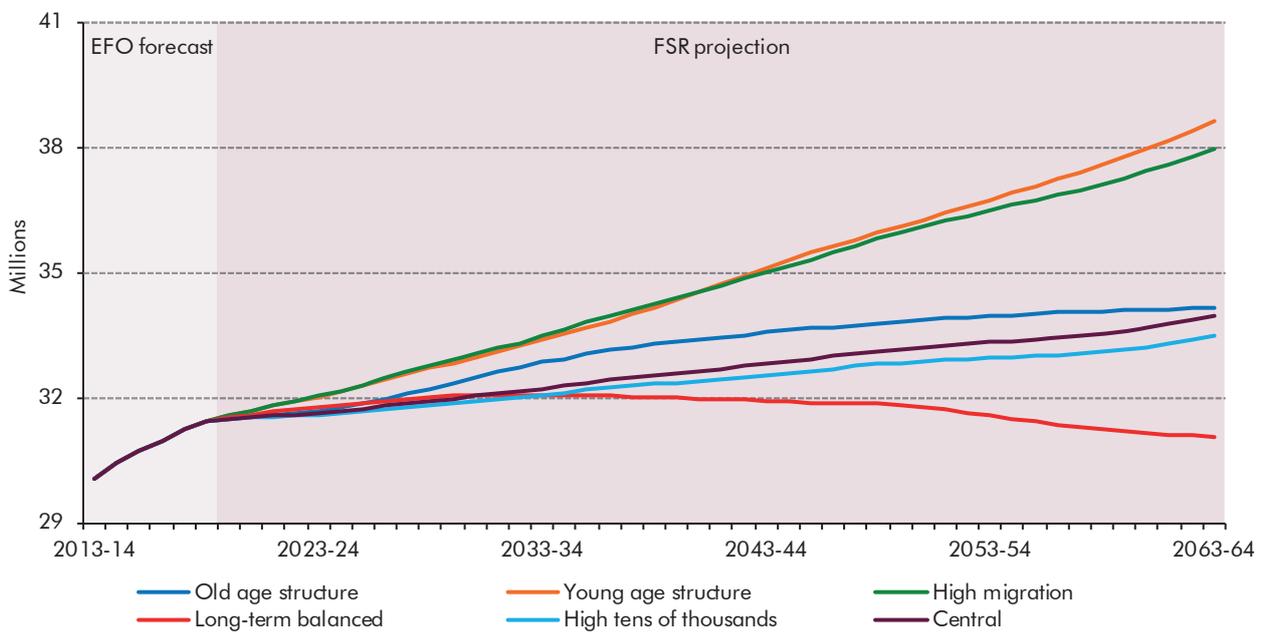
Table 3.5: Long-term economic determinants

		Annual growth rate, unless otherwise stated
<b>Labour productivity</b>	2.2	Based on historical trend between 1971 and 2008
<b>Prices and earnings</b>		
Average earnings	4.4	Product of labour productivity and GDP deflator
Public sector earnings	4.4	Assumed to grow in line with private sector
GDP deflator	2.2	Constant from end of forecast
CPI	2.0	Constant from end of forecast at inflation target
RPI	3.3	Calculated as CPI plus 1.3 percentage points
RPIX	3.2	Calculated as CPI plus 1.2 percentage points
'Triple lock'	4.7	Calculated as average earnings plus 0.3 percentage points
<b>Interest rates (per cent)</b>		
Gilt rate	5.0	OBR assumption
Bank Rate	5.0	OBR assumption
<b>Employment growth</b>		
Public sector workforce growth	0.25	Broadly in line with total employment growth

- 3.26 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 between 1971 and 2008. 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. We have extended our modelling further up the age distribution this year. This has small effects in most variants, but is more important in the old-age variant. From this we calculate an employment rate consistent with an assumed non-accelerating inflation rate of unemployment (NAIRU) of 5.4 per cent of the labour force, consistent with our *EFO* forecast. More information on our methodology is contained in Annex B of *FSR 2011*.
- 3.27 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 in effect shift exit rates along 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. We smooth this transmission over earlier periods, as individuals would be expected to adapt their labour market participation choices over a longer period. Annex A discusses a number of labour market trends in more detail, including employment trends among older workers.
- 3.28 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 3.6. (Annual data are available on our website.)

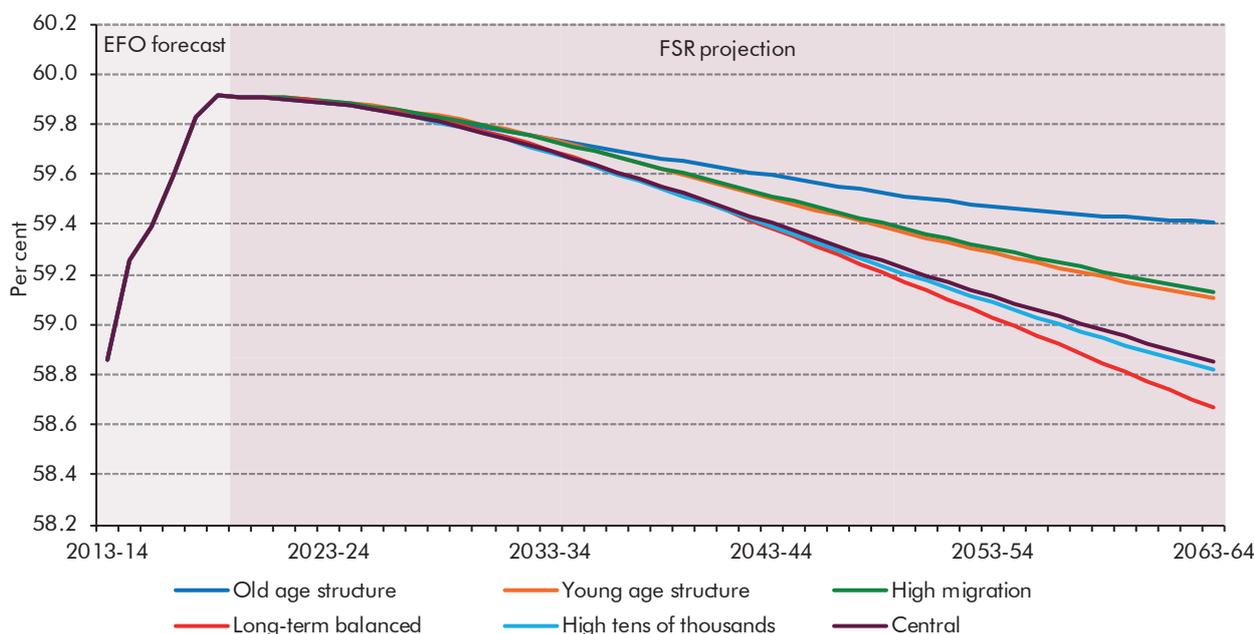
3.29 Our central employment growth projections are slightly lower than in last year’s report. The latest demographic projections reduce employment growth by around 0.1 per cent a year on average over the long-term relative to last year’s *FSR*. Changes to the SPA profile offset around half of this reduction. But the underlying employment changes persist throughout the projection period, whereas the changes relating to our modelling of the SPA are concentrated in particular periods. The impact is more pronounced in our projections for employment under the old age population variant, where a higher SPA, and a relatively larger proportion of older workers affected by it, increase employment levels in comparison to our central projection through the 2030s.

Chart 3.4: Employment projections



Source: OBR

Chart 3.5: Employment rate projections (16+ population)



Source: OBR

Table 3.6: Real GDP growth projections

	Annual GDP growth, per cent				
	2013-14 to 2023-24	2023-24 to 2033-34	2033-34 to 2043-44	2043-44 to 2053-54	2053-54 to 2063-64
OBR central <sup>1</sup>	2.4	2.4	2.4	2.4	2.4
High migration	2.5	2.6	2.7	2.6	2.6
Long-term balanced	2.5	2.3	2.2	2.1	2.0
High tens of thousands	2.4	2.4	2.4	2.3	2.4
Young age structure	2.5	2.6	2.7	2.7	2.7
Old age structure	2.4	2.6	2.4	2.3	2.3

<sup>1</sup> Equivalent to the ONS's 'low migration' population variant.

- 3.30 Our other long-term assumptions are unchanged. 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, and that the long-run difference between RPI and CPI inflation is around 1.3 percentage points. Our assumption for GDP deflator growth is based on consumption deflator growth remaining in line with CPI inflation and other components of the GDP deflator growing at close to historic rates. Our medium-term forecast allows for a small wedge between the consumption deflator and CPI, explained by stronger growth in imputed rents. We do not model this explicitly further out, since the approach to measuring an imputed activity should have no bearing on tax receipts or spending in the long term.
- 3.31 ONS revisions, mainly following *Blue Book 2013* (which included revised estimates for imputed rents), raised the level of nominal GDP by 1.6 per cent in 2012-13. Once our medium-term forecast changes are also taken into account, nominal GDP in 2018-19 is now expected to be 3.3 per cent higher than projected in last year's *FSR*. Some of this

additional growth is cyclical, and therefore temporary, while changes relating to imputed rents persist. Adding in changes to our employment projections, the level of nominal GDP converges towards last year's projections, settling around 1 per cent higher from the mid-2040s. This increase in nominal GDP reduces all fiscal aggregates as a share of GDP.

- 3.32 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 grows by 4.4 per cent a year.
- 3.33 Market expectations for interest rates continue to lie below our projections for nominal GDP growth. The Bank of England's February 2014 *Inflation Report* explored some reasons why the equilibrium interest rate may remain relatively low for some time.<sup>2</sup> The Bank's Deputy Governor, Sir Charlie Bean, recently suggested that over a longer horizon it might be reasonable to think nominal interest rates would return to 5 per cent.<sup>3</sup> 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 widen this differential slightly, but the revision is small in the context of the wider uncertainty around both GDP growth and interest rates.

## How we project the public finances

- 3.34 Our projections up to 2018-19 are consistent with the March 2014 *EFO* forecast. From 2019-20, 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. This approach will not however capture cyclical swings in the economy that may arise over time. In last year's projections, the output gap did not close until 2020-21, so running projections in this bottom-up way prior to that point would have missed the cyclical improvement in the fiscal position that we would otherwise have expected. Our bottom-up analysis at the time therefore only ran from 2021-22 onwards.
- 3.35 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 the changing demographic composition of the UK. We make use of individual spending and revenue profiles for males and females, each one 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 year of 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

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<sup>2</sup> See the box 'Bank Rate in the medium term', Bank of England (2014a).

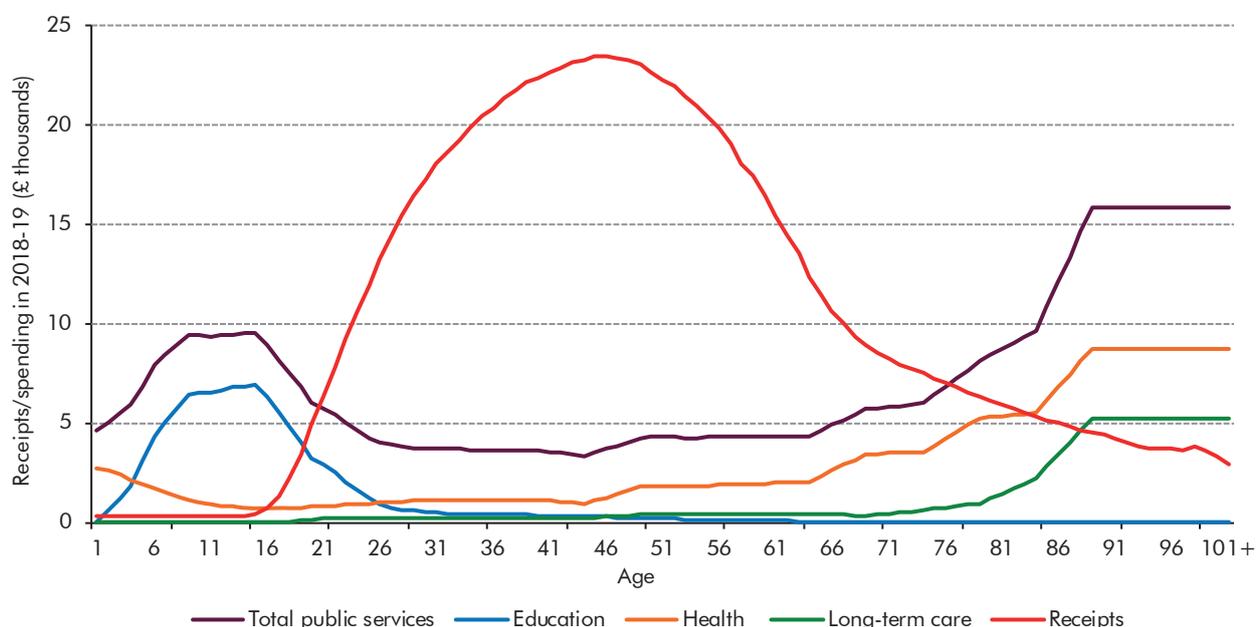
<sup>3</sup> Interview with Sky News, June 2014.

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the projection horizon and combined with population projections to generate future spending and revenue streams.

3.36 Chart 3.6 shows representative profiles for public service spending items and for tax. This has been achieved by applying the relevant profiles to the disaggregated spending forecast in 2019-20. This shows that in early life, people consume a relatively large amount of health care and state-funded education. 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. In later life, they consume more health care and long-term care,<sup>4</sup> but will pay less tax as their incomes and spending decline.

Chart 3.6: Representative profiles for tax and public services spending



Source: OBR

3.37 Social security spending and public service pension spending are modelled outside our long-term projection model, but will also add to spending in Chart 3.6. The Department for Work and Pensions projects social security payments using OBR assumptions. This allows us to incorporate the additional complexities of these benefit items explicitly, including changes in the SPA. Similarly, the Government Actuary’s Department (GAD) has projected unfunded public service pension payments. Finally, 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.

<sup>4</sup> We do not use the spending profile for long-term care illustrated in the chart having introduced more detailed projections of demand for long-term care.

- 3.38 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.

## Public spending and revenue projections to 2063-64

- 3.39 In this section, we present the results of our bottom-up spending and revenue projections, using the methodology and modelling assumptions outlined in the previous section. 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.

### Public spending

- 3.40 Table 3.7 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 34.3 per cent of GDP at the end of our medium-term forecast in 2018-19, to 39.3 per cent of GDP by 2059-60, before falling slightly to 39.1 per cent of GDP in 2063-64. That would represent an overall increase of 4.8 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.
- 3.41 Table 3.8 shows changes since last year's report. We have extended the projections from that report out to 2063-64, to ease 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 0.5 per cent of GDP greater than projected last year. The main changes are:
- the output gap closing within our medium-term forecast horizon, rather than three years later, as we projected last year. This led to spending falling initially as a share of GDP in last year's projections, as GDP grew at above-trend rates. That is not repeated this year;
  - the higher proportions of older and younger people in the latest population projections, relative to those of working age. As a share of GDP, relatively more older people increases health, long-term care and pensions spending, while relatively more younger people increases spending on education;
  - lower spending on state pensions, which can be more than explained by the policy decision to link the State Pension age to future life expectancy; and
  - further spending cuts in 2018-19, the final year of our medium-term forecast, which reduces health, education and other spending as a share of GDP. We assume these

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cuts are spread evenly across departmental spending, implying that the overall impact of the cuts cumulates gradually over time.

Table 3.7: Non-interest spending projections

	Per cent of GDP							
	Estimate <sup>1</sup>		FSR Projection					
	2013-14	2018-19	2020-21	2023-24	2033-34	2043-44	2053-54	2063-64
Health	7.9	6.4	6.5	6.7	7.5	8.0	8.4	8.5
Long-term care	1.2	1.2	1.4	1.4	1.7	2.0	2.2	2.3
Education	5.3	4.3	4.3	4.4	4.3	4.2	4.2	4.2
State pensions	5.8	5.5	5.4	5.7	6.7	7.4	7.6	7.9
Pensioner benefits <sup>2</sup>	1.0	0.8	0.8	0.8	0.9	1.0	1.0	0.9
Public service pensions	2.2	2.2	2.1	2.1	1.9	1.6	1.4	1.2
<b>Total age-related spending</b>	<b>23.3</b>	<b>20.4</b>	<b>20.6</b>	<b>21.2</b>	<b>23.0</b>	<b>24.2</b>	<b>24.8</b>	<b>25.1</b>
Other welfare benefits <sup>2</sup>	5.8	5.2	5.3	5.3	5.2	5.2	5.3	5.3
Other spending <sup>2</sup>	11.4	8.6	8.7	8.5	8.5	8.5	8.7	8.7
<b>Spending<sup>3</sup></b>	<b>40.5</b>	<b>34.3</b>	<b>34.5</b>	<b>35.0</b>	<b>36.7</b>	<b>37.9</b>	<b>38.8</b>	<b>39.1</b>

<sup>1</sup> Spending consistent with the March 2014 *Economic and fiscal outlook*.

<sup>2</sup> Last year's pensioner and welfare benefits projections included council tax benefit. This has now been devolved to local authorities, and so is excluded from our benefits projections, and is now implicitly included in 'other spending'.

<sup>3</sup> Excludes interest and dividends.

Table 3.8: Changes in non-interest spending projections since *FSR 2013*

	Per cent of GDP							
	Estimate <sup>1</sup>		FSR Projection					
	2013-14	2018-19	2020-21	2023-24	2033-34	2043-44	2053-54	2063-64
Health	-0.2	-0.6	-0.3	-0.3	-0.2	-0.2	-0.2	-0.3
Long-term care	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Education	-0.1	-0.3	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1
State pensions	-0.2	-0.3	-0.3	-0.2	-0.1	-0.2	-0.1	-0.6
Pensioner benefits <sup>2</sup>	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Public service pensions	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.1
<b>Total age-related spending</b>	<b>-0.7</b>	<b>-1.4</b>	<b>-1.0</b>	<b>-0.9</b>	<b>-0.5</b>	<b>-0.6</b>	<b>-0.6</b>	<b>-1.4</b>
Other welfare benefits <sup>2</sup>	-0.2	-0.2	-0.2	-0.2	-0.3	-0.2	-0.3	-0.3
Other spending <sup>2</sup>	-0.5	-0.6	-0.4	-0.3	-0.3	-0.2	0.0	0.0
<b>Spending<sup>3</sup></b>	<b>-1.4</b>	<b>-2.2</b>	<b>-1.5</b>	<b>-1.4</b>	<b>-1.1</b>	<b>-1.1</b>	<b>-0.9</b>	<b>-1.6</b>

<sup>1</sup> Spending consistent with the March 2014 *Economic and fiscal outlook*.

<sup>2</sup> Last year's pensioner and welfare benefits projections included council tax benefit. This has now been devolved to local authorities, and so is excluded from our benefits projections, and is now implicitly included in 'other spending'. *FSR 2013* projections have been adjusted to ensure comparability between the two sets of numbers.

<sup>3</sup> Excludes interest and dividends.

## Health

3.42 Table 3.7 shows spending on health rising from 6.4 per cent of GDP in 2018-19 to 8.5 per cent of GDP in 2063-64. 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 care services, stabilises.

- 3.43 Spending in 2018-19 is 0.6 per cent of GDP lower than in last year's *FSR*, because of departmental spending cuts pencilled in beyond the current Spending Review period and higher nominal GDP in that year. The higher GDP in part reflects a stronger cyclical recovery, bringing forward some of the growth which we had assumed would continue until 2020-21 in last year's report. By 2020-21, the difference with last year's projections is around 0.3 per cent of GDP. This broadly knocks through to the rest of the period, with the latest population projections implying only modestly higher spending.
- 3.44 As in previous *FSRs*, this is the largest component of age-related spending in our projection, and the wider fiscal outlook is therefore quite 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 revisit this assumption later in the chapter, as well as the assumption that health care 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.

### Long-term care

- 3.45 Spending on long-term care is expected to increase from 1.2 per cent of GDP in 2018-19 to 2.3 per cent of GDP by 2063-64. Both figures are 0.1 per cent of GDP lower than projected last year, mainly due to lower outturn data. The profile in the intervening periods is little changed. The increase over time reflects the combination of an ageing population and recent 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. These reforms are expected to increase spending by 0.3 per cent of GDP in the long term, similar to the estimate discussed in Annex B of *FSR 2013*. Since then, estimates for the proportion of care home residents who are self-funders have increased slightly, leading to a fractional rise in the expected cost of the reforms. 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

- 3.46 While education spending is a substantial component of spending that is driven by demographics, it is not projected to be a source of spending pressure over the coming decades. The latest demographic projections imply slightly lower spending in the 2020s and marginally higher spending thereafter, mainly due to changes in assumed fertility rates, which are lower in the earlier years of the projection and higher in the long term. These changes are on top of the assumed reduction in the medium term stemming from the broader implied cuts in departmental spending.

3.47 The Government's Autumn Statement 2013 announcement to remove the cap on the number of students at publicly-funded higher education institutions in England implies additional spending on teaching and maintenance grants. The Treasury estimated this would increase spending, including Barnett consequentials, by £720 million in 2018-19.<sup>5</sup> We implicitly assume that the grant element is met within the wider education budget. Funding for student loans is treated as a financial transaction, rather than spending, and so is not included in the education line in Table 3.7. We discuss student loans further below in the chapter, and also in more detail in Annex B.

### State pensions

3.48 Spending on state pensions is projected to rise over the projection period, from 5.5 per cent of GDP in 2018-19 to 7.9 per cent of GDP in 2063-64, driven largely by demographic trends. This line includes many items in addition to the basic state pension and single tier pension, such as pension credit, winter fuel payments, TV licences and the Christmas bonus.

3.49 As in last year's *FSR*, we assume both the basic state pension and single-tier pension are uprated using the 'triple lock'. The 'triple lock' policy states that the basic state pension will rise by the highest of earnings growth, CPI inflation or 2.5 per cent – and 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. We assume that the 'triple lock' is equivalent to earnings growth plus 0.30 per cent a year, unchanged from last year's assumption.

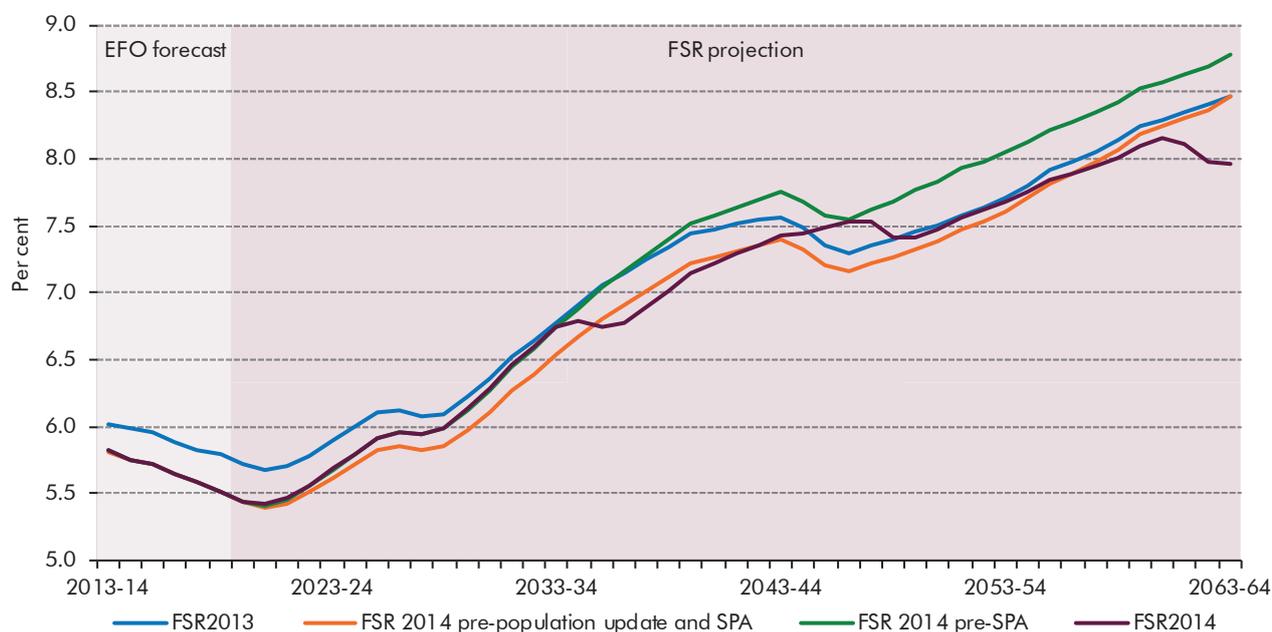
3.50 The central projections presented in Table 3.7 reflect changes to the SPA, as well as the latest population projections. To isolate the impacts of the two, Chart 3.7 shows projections of spending as a per cent of GDP (generated in a consistent manner) on the following bases:

- last year's projections;
- our 2014 projections before changes to the SPA and the population projections;
- our 2014 projections taking on board the latest population projections, but not the latest profile for the SPA; and
- our central 2014 projections, post SPA changes.

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<sup>5</sup> See paragraph 1.203, Autumn Statement 2013.

Chart 3.7: State pensions spending projections



Source: OBR

### 3.51 Chart 3.7 shows that:

- excluding the new population projections and SPA changes, our forecast for spending in 2063-64 would have been unchanged. However, this reflects the combination of an improvement over the medium-term period that dissipates over time, particularly from the late 2030s. This less favourable profile beyond the medium term mainly reflects changes to our costing of the introduction of the single-tier pension, which is expected to reduce spending over time, primarily because it will no longer be possible to build up large amounts of state second pension. Our latest projections show little impact on spending until the 2040s, with savings rising to 0.4<sup>6</sup> per cent of GDP by 2063-64. Last year we projected savings rising to 0.7 per cent of GDP by the 2060s. The difference can be explained by methodological updates, including using unrounded earnings growth figures to model the counterfactual basic state pension;
- taking on board the latest population projections raises projected spending as a share of GDP, as the proportion of older people has increased. The absolute number of eligible pensioners in future is marginally higher, and the number of those in prime working age is lower; and
- on the basis of the latest population projections, linking the SPA to life expectancy would bring the forward the legislated rise to 68 from the mid-2040s to the mid-2030s, reducing spending over the interim period by around 0.4 per cent of GDP. Implementing additional increases to 69 and then 70 would also reduce spending as a

<sup>6</sup> This is the estimated savings once the changes to the population projections and SPA are taken into account; excluding these changes, the savings would have been 0.5 per cent of GDP.

share of GDP in the late 2040s and early 2060s. In total, spending falls by 0.9 per cent of GDP in 2063-64. The cumulative effect of these projected SPA-related changes, including wider effects on receipts and working age benefits, is to reduce public sector net debt in 2063-64 by 17 per cent of GDP.

### Public service pensions

- 3.52 Gross public service pension expenditure (before offsetting member contributions) is projected to fall from 2.2 per cent of GDP in 2018-19 to 1.2 per cent of GDP in 2063-64. The decline in part stems from pension reforms since 2010, which reduce spending by around half a per cent of GDP by 2063-64, mainly relating to the decision to uprate pensions in payment by CPI rather than RPI inflation. These were discussed in Annex A of *FSR 2012*. This is on top of the effect of reductions in the public sector workforce in our medium-term forecast.
- 3.53 The effect on the public sector workforce of additional spending cuts pencilled in for 2018-19 since last year's report reduce pension payments in later years, as do our latest medium-term assumptions for public sector earnings. The projections, provided by GAD, now also take on board membership data from the latest actuarial valuations as well as our projections of SPA changes, and model actual scheme benefit designs rather than the standard reference schemes where possible. These changes do not materially affect the projections.
- 3.54 Employee member contributions to public service pension schemes, which are treated as negative spending, are included in the 'other spending' line of Table 3.7. Contributions fall slightly as a share of GDP over time, so net contributions move from 1.7 per cent of GDP in 2018-19 to 0.8 per cent of GDP in 2063-64.
- 3.55 The public service pensions line in our *EFO* documents 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 (DELs) and negative spending in public sector pensions. The Budget 2014 measure to change employer contribution rates does not affect the spending pressure arising from public sector pensions, but instead reduces spending available to departments to spend on other activities (which would have affected net borrowing).

### Other welfare benefits

- 3.56 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. A disaggregation by type of benefit is available on our website. We assume most working age benefits essentially move in line with the share of the population in working age. The latest population projections imply small reductions in spending as a share of GDP, whereas increasing the SPA increases the number of people classified as working age and therefore eligible for working-age benefits. Both effects are projected to be less than 0.1 per cent of GDP and they broadly cancel out.

- 3.57 Our housing benefit projections are based on assumptions for the number of households and house ownership. We make neutral assumptions that the average household size remains broadly constant, and that the proportion of owner-occupiers stabilises soon after the end of our medium-term forecast horizon. The future shape of the labour market will be another key driver of patterns in welfare spending. Annex A discusses labour market trends in more detail, and considers how these may go on to affect future spending.

### Other spending

- 3.58 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 2018-19 onwards, locking in the implied spending cuts up to that point.
- 3.59 This category also includes write-offs on student loans, which only affect spending once they crystallise. Under the current student loans system, debts unpaid over a 30-year period 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, with that figure higher than last year following the removal of the cap on student numbers and updated modelling of repayments (see Annex B for further detail).
- 3.60 As set out in our March *EFO*, spending to cover losses on gilts sold by the Bank of England's Asset Purchase Facility extends beyond our medium-term horizon, peaking at 0.3 per cent of GDP in 2019-20 under our central projections, before winding down in 2022-23. There is huge uncertainty about the timing and pace of this unwinding.

### Receipts

- 3.61 As with spending, the revenue projections from 2018-19 presented in Table 3.9 reflect changes in the absolute size and age composition of the population. The big picture is that non-interest revenues are now projected to be broadly flat as a share of GDP over the projection period, rising from 37.3 per cent of GDP in 2018-19 to 37.4 per cent of GDP in 2063-64. We had projected receipts to rise by 1.1 per cent of GDP over the same period in last year's report.
- 3.62 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. Box 3.2 on fiscal drag shows that if we had increased income tax and national insurance contributions allowances by prices instead of earnings, this would have increased revenues by around 2.1 per cent of GDP by 2033-34.

The fiscal impact of future government activity:  
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Table 3.9: Non-interest receipts projections

	Per cent of GDP							
	Estimate <sup>1</sup>		FSR projection					
	2013-14	2018-19	2020-21	2023-24	2033-34	2043-44	2053-54	2063-64
Income tax	9.5	10.4	10.5	10.5	10.4	10.4	10.5	10.5
NICs	6.5	6.8	6.7	6.7	6.5	6.5	6.5	6.5
Corporation tax	2.4	2.2	2.2	2.2	2.2	2.2	2.1	2.1
VAT	6.5	6.3	6.3	6.3	6.4	6.4	6.4	6.3
Capital taxes	1.3	1.8	1.8	1.8	1.9	1.9	2.0	2.0
Other taxes	10.4	9.8	9.8	9.8	9.9	10.0	10.0	10.0
<b>Receipts<sup>2</sup></b>	<b>36.5</b>	<b>37.3</b>	<b>37.3</b>	<b>37.3</b>	<b>37.3</b>	<b>37.4</b>	<b>37.5</b>	<b>37.4</b>

<sup>1</sup> Receipts consistent with the March 2014 *Economic and fiscal outlook*.

<sup>2</sup> Excludes interest and dividends.

Table 3.10: Changes in non-interest receipts projections since *FSR 2013*

	Per cent of GDP							
	Estimate <sup>1</sup>		FSR projection					
	2013-14	2018-19	2020-21	2023-24	2033-34	2043-44	2053-54	2063-64
Income tax	-0.2	-0.1	0.0	0.0	-0.1	-0.2	-0.2	-0.2
NICs	-0.2	-0.2	-0.2	-0.2	-0.3	-0.4	-0.3	-0.4
Corporation tax	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
VAT	0.0	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.2
Capital taxes	-0.1	0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Other taxes	-0.1	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.5
<b>Receipts<sup>2</sup></b>	<b>-0.7</b>	<b>-0.5</b>	<b>-0.8</b>	<b>-0.7</b>	<b>-0.8</b>	<b>-1.1</b>	<b>-1.1</b>	<b>-1.4</b>

<sup>1</sup> Receipts consistent with the March 2014 *Economic and fiscal outlook*.

<sup>2</sup> Excludes interest and dividends.

- 3.63** 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. However, the relative increase in the share of older people in the latest population projections comes at the expense of the proportion of people around prime working age (see Chart 3.3), who generally pay greater amounts of tax. These compositional changes now broadly cancel out for income tax and VAT. They lead to a slight increase in capital taxes as those nearing retirement or in retirement are assumed to sell businesses and other financial assets. They also imply a fall in national insurance contributions (NICs) as a share of GDP.
- 3.64** People above the SPA are exempt from paying employee NICs, so such receipts are concentrated among people of working age. 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 go up in cash terms. Given the progressive nature of the tax system and 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.

The net effect of these trends – greater numbers paying tax, but at lower average rates – is only a very slight increase in personal taxes as a share of GDP.

- 3.65 Other changes since last year’s report reflect medium-term forecast changes relative to last year’s projection for 2020-21, the point at which we then assumed the output gap would close. We projected receipts to increase as a share of GDP beyond the medium-term horizon out to 2020-21. The bulk of the improvement, based on past relationships between receipts and the economic cycle, was projected to come through increases in corporation tax and capital taxes as company profits and asset prices were projected to recover with the wider economy. These cyclical effects are now captured in our medium-term forecast, where the output gap closes by 2018-19. They no longer affect the long-term projections.
- 3.66 In our more detailed analysis of tax revenue sustainability in Chapter 4, we consider non-demographic factors that might affect particular revenue streams over the long term. Chapter 4 updates the analysis from previous *FSRs* of North Sea revenues and transport taxes.

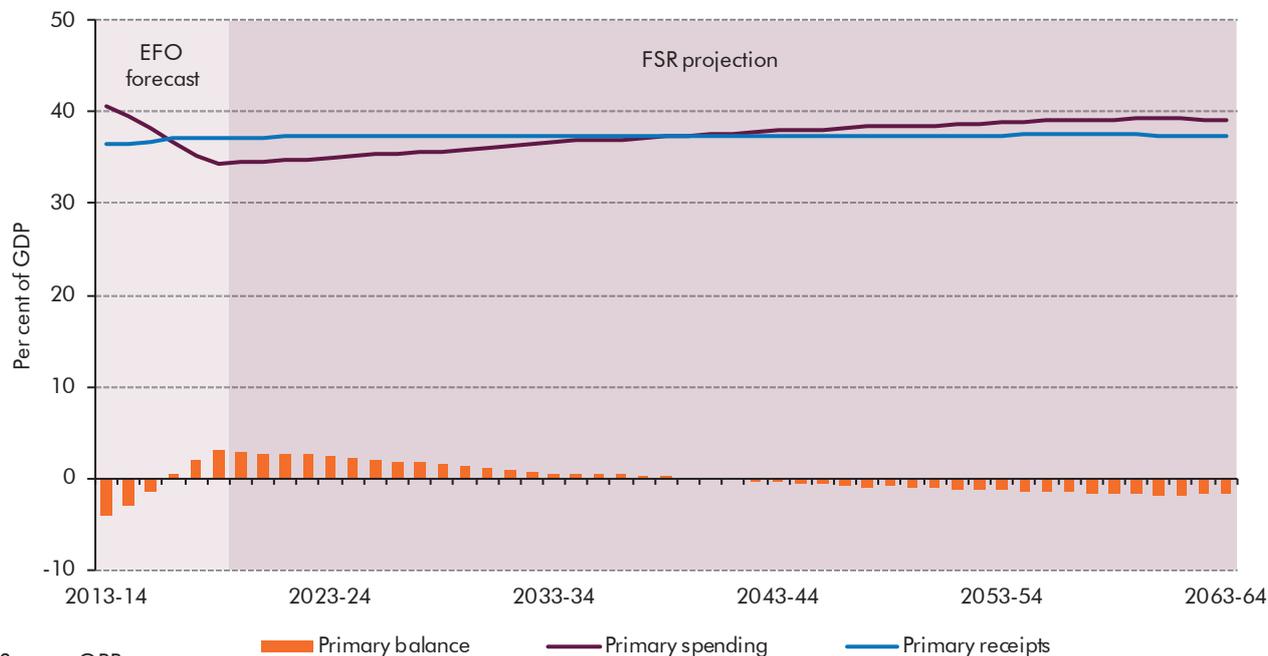
## The implications for the public finances

### The central projections

#### Primary balance

- 3.67 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, and 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 3.0 per cent of GDP in 2018-19 to roughly balance in the late-2030s and then to a deficit of 1.7 per cent of GDP in 2063-64 – an overall deterioration of 4.7 per cent of GDP, equivalent to £77 billion in today’s terms. In effect, we project that over the best part of five decades these primarily demographic pressures would reverse around half of the improvement to the primary balance of 10.1 per cent of GDP that we expect to see between 2009-10 and 2018-19, which includes the reversal of the previous government’s fiscal stimulus package and the subsequent consolidation.

Chart 3.8: Primary receipts and spending and the primary balance



Source: OBR

### Student loans and other financial transactions

- 3.68 In order to see how this projected deterioration in the primary balance would feed through to public sector net debt, we 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 the current balance or public sector net borrowing.
- 3.69 For the majority of financial transactions we assume that there is a net effect of zero over the projection period, with the exception of student loans and the winding down of Bradford & Bingley and Northern Rock (Asset Management) (B&B and NRAM), consistent with UKAR’s latest business plans. As the assets of B&B and NRAM are wound down over time, their impact on net debt falls close to zero by the mid-2020s.
- 3.70 Since last year’s report, the Government has announced that it intends to sell the pre-2012 student loan book and to remove the cap on student numbers attending higher-education institutions.
- 3.71 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. Assuming the assets were sold at fair value, the expected return to the Government at the point of sale would be zero. We have taken the neutral assumption that sales will be evenly spread across the five years beginning 2015-16, implying that no repayments are received by the Exchequer beyond 2019-20. In effect this crystallises losses on the loans: 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. But there would be no reason to believe that selling the loan book at fair value would affect the eventual debt level in the long term.

- 3.72 Removing the cap on student numbers increases future outlays under the current system. Cash spending, on English loans only, are now projected to settle at around 0.7 per cent of GDP in the long term, around 0.2 per cent of GDP higher than projected last year. Around half of the change reflects the removal of the cap, with the remainder mainly due to higher-than-expected take-up of loans by students in 2012-13, which we assume will be representative of future cohorts.
- 3.73 Repayments on the new loans are expected to rise gradually to around 0.5 per cent of GDP in the mid-2040s, as the first group of students under the new system approach the end of their 30-year repayment cycle. Repayments are higher than last year, but by less than might be expected given the greater number of students making repayments, as repayments per student are now expected to be lower over time. We project that the direct flows will add 5.4 per cent of GDP to net debt in 2018-19, rising to 9.8 per cent of GDP by the mid-2030s, and then falling to 8.3 per cent of GDP in 2063-64. The equivalent figures in last year's projections were 6.7 per cent of GDP and 5.0 per cent of GDP. Our student loan projections, and the uncertainties around them, are discussed in more detail in Annex B.

### Public sector net debt and net interest payments

- 3.74 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, which is higher this year in line with higher outlays, although as an accrued measure it does not affect net debt. We have also raised our medium-term forecast for interest and dividend receipts on assets held by the public sector, which knocks through to the long-term projections. As shown in Tables 3.11 and 3.12, net interest is 3.0 per cent of GDP in 2063-64, 1.1 per cent of GDP lower than previously projected, of which 0.8 per cent of GDP reflects lower debt interest, and the remainder higher interest receipts.

Table 3.11: Central projections of fiscal aggregates

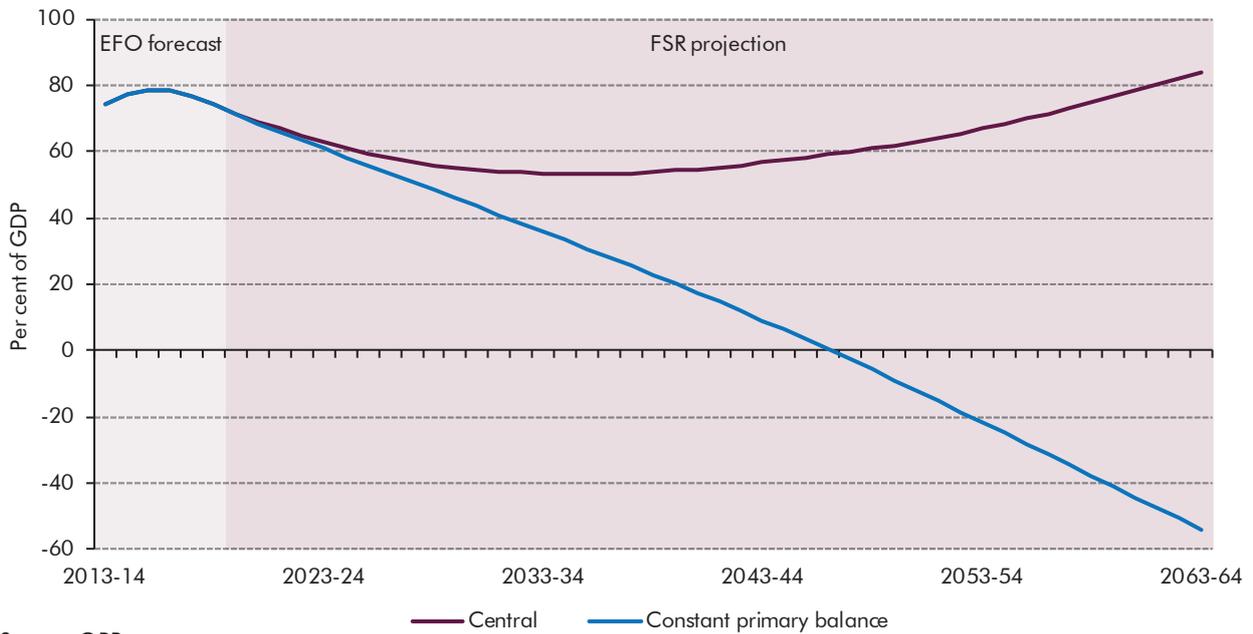
	Per cent of GDP							
	EFO Forecast		FSR projection					
	2013-14	2018-19	2020-21	2023-24	2033-34	2043-44	2053-54	2063-64
Primary spending	40.5	34.3	34.5	35.0	36.7	37.9	38.8	39.1
Primary revenue	36.5	37.3	37.3	37.3	37.3	37.4	37.5	37.4
Primary balance	-4.0	3.0	2.7	2.3	0.5	-0.5	-1.3	-1.7
Net interest	1.8	2.9	2.7	2.3	1.8	1.7	2.2	3.0
Total Managed Expenditure	43.5	38.0	38.0	38.2	39.6	40.9	42.3	43.3
Public Sector Current Receipts	37.7	38.1	38.1	38.2	38.4	38.7	38.7	38.6
Public sector net borrowing	5.8	-0.1	-0.1	0.0	1.2	2.2	3.5	4.7
Public sector net debt	75	74	69	63	54	57	67	84

Table 3.12: Changes in the central projections of fiscal aggregates since *FSR 2013*

	Per cent of GDP							
	EFO Forecast		FSR projection					
	2013-14	2018-19	2020-21	2023-24	2033-34	2043-44	2053-54	2063-64
Primary spending	-1.4	-2.2	-1.5	-1.4	-1.1	-1.1	-0.9	-1.6
Primary revenue	-0.7	-0.5	-0.8	-0.7	-0.8	-1.1	-1.1	-1.4
Primary balance	0.8	1.7	0.6	0.6	0.3	0.0	-0.2	0.2
Net interest	-0.2	-0.2	-0.3	-0.5	-0.8	-1.0	-1.0	-1.1
Total Managed Expenditure	-1.6	-2.2	-1.7	-1.7	-1.7	-1.8	-1.6	-2.4
Public Sector Current Receipts	-0.7	-0.3	-0.7	-0.6	-0.6	-0.8	-0.8	-1.1
Public sector net borrowing	-0.9	-1.9	-0.9	-1.0	-1.1	-1.1	-0.8	-1.4
Public sector net debt	-5	-9	-9	-9	-13	-15	-14	-17

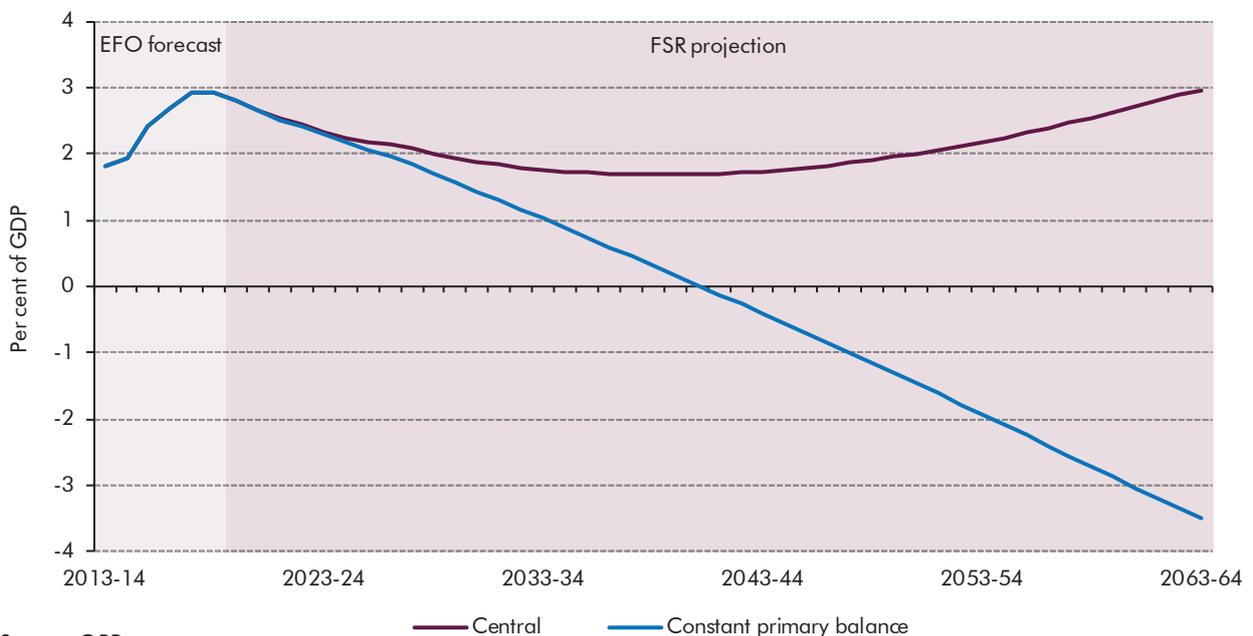
- 3.75 Charts 3.9 and 3.10 show the paths of public sector net debt and net interest as a share of GDP in our central projection, comparing them to the paths if the primary balance was to remain constant at its 2018-19 level.
- 3.76 Our projection of public sector net debt falls from its medium-term peak of around 79 per cent of GDP in 2015-16 to just over 53 per cent of GDP in the mid-2030s, before rising to 84 per cent of GDP after 50 years. Over the comparable 50-year period, our *FSR 2013* projections showed debt peaking at 86 per cent of GDP in 2016-17, before falling to 66 per cent in the early-2030s and then increasing to over 100 per cent of GDP by 2063-64 – above that in our current projections. We discuss the source of changes in the next section.
- 3.77 Longer-term spending pressures, if unaddressed, would put the public finances on an unsustainable path in our central projection. Public sector net debt would only be marginally above its recent peak, but still be 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 3.9: Projections of public sector net debt



Source: OBR

Chart 3.10: Projections of net interest payments



Source: OBR

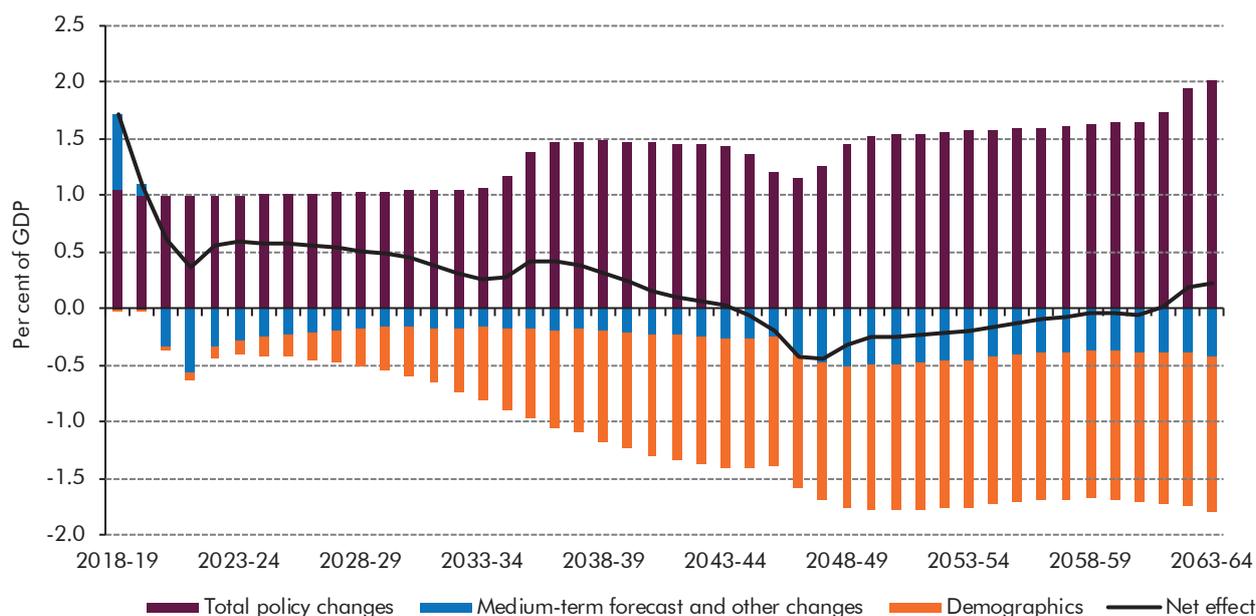
### Changes since last year's projections

3.78 Chart 3.11 provides a stylised decomposition of the changes in the primary balance since last year's FSR over the projection period and Table 3.13 shows a more detailed split for the final year. They show that:

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

- excluding policy changes, the headline primary balance is now more positive over the medium-term forecast period. However, this reflects a cyclical improvement in the fiscal position that masks a small underlying structural deterioration worth 0.2 per cent of GDP by the end of the medium-term forecast. This becomes apparent by the early 2020s, at which point we had closed the output gap in last year's projections, making the two sets of projections more comparable. Modelling changes within the long-term projections also marginally reduce the primary balance, principally our revised costing for the single tier pension reform;
- the latest population projections gradually weaken the primary balance over time, as the proportion of prime-age individuals – who pay relatively more in taxes – falls, and the proportions of younger people – requiring education funding – and older people – that receive pensions and tend to consume more health care and long-term care – rises; and
- these changes have generally been offset by policies announced since last year's report. Measures affecting the medium-term forecast improve the primary balance by around 1 per cent of GDP, primarily reflecting an additional year of spending cuts in 2018-19. The intention to link changes in the SPA to life expectancy implies that the rise to 68 will be brought forward a decade into the mid-2030s and that there will be further increases to 69 and then 70 within the 50 year projection period, reducing state pensions spending in particular. By 2063-64, policy changes improve the primary balance by 2.0 per cent of GDP, offsetting the pre-policy deterioration of 1.8 per cent of GDP and delivering an overall improvement of 0.2 per cent of GDP.

Chart 3.11: Decomposition of changes in the primary balance since *FSR 2013*

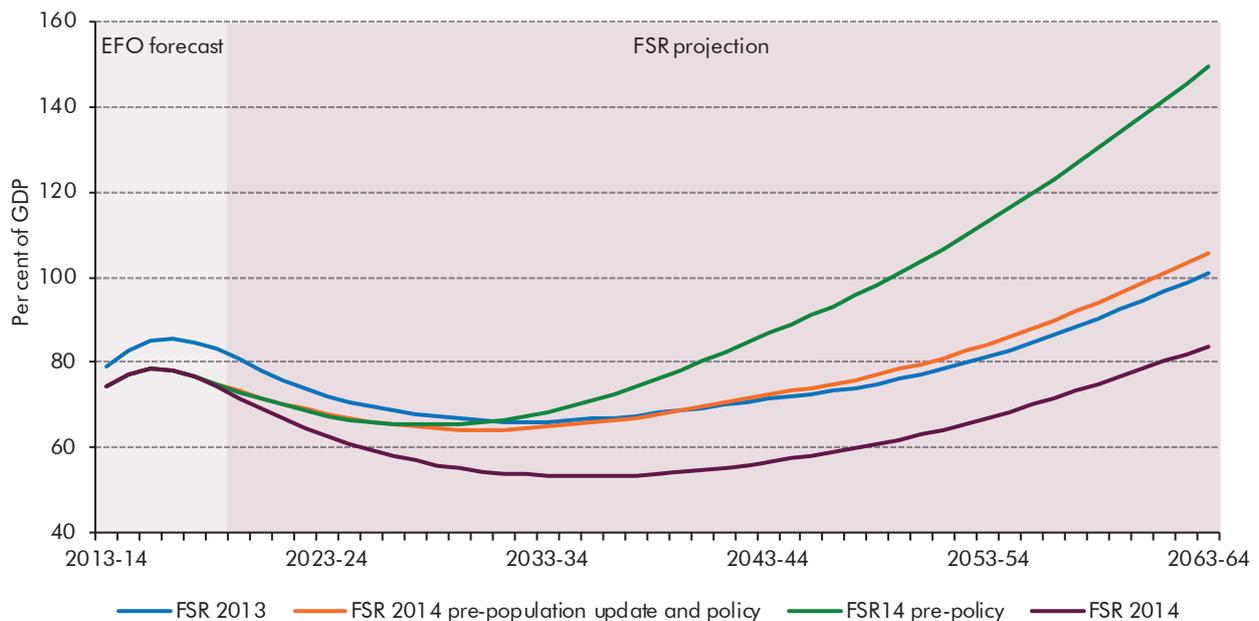


Source: OBR

3.79 Chart 3.12 and Table 3.13 illustrate the cumulative effects of these changes on our net debt projections. They show that:

- our modelling changes have only a small impact on net debt. Net interest payments – which affect net debt, but not the primary balance – are lower in the medium term, partially offsetting the underlying reduction in the primary balance;
- excluding the impact of policy changes, net debt would have risen to around 150 per cent of GDP by 2063-64, once the latest demographic projections are taken into account. This compares to around 100 per cent of GDP projected last year; and
- policy changes more than offset this rise, mainly relating to changes that take effect in the medium term. The assumed increases in the SPA improve the primary balance towards the end of the projection period, and therefore have a smaller impact on net debt over a 50-year horizon.

Chart 3.12: Decomposition of changes in the net debt projection since *FSR 2013*



Source: OBR

Table 3.13: Changes in the primary balance and net debt in 2063-64

	Per cent of GDP	
	Primary balance	Net debt
FSR 2013	-1.9	101
FSR 2014	-1.7	84
<b>Change</b>	<b>0.2</b>	<b>-17</b>
of which:		
<b>Pre-policy measures</b>	<b>-1.8</b>	<b>49</b>
Demographics	-1.4	44
Other	-0.4	5
<b>Policy measures</b>	<b>2.0</b>	<b>-66</b>
Medium-term measures	1.1	-49
Changes to the State Pension age	0.9	-17

3.80 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

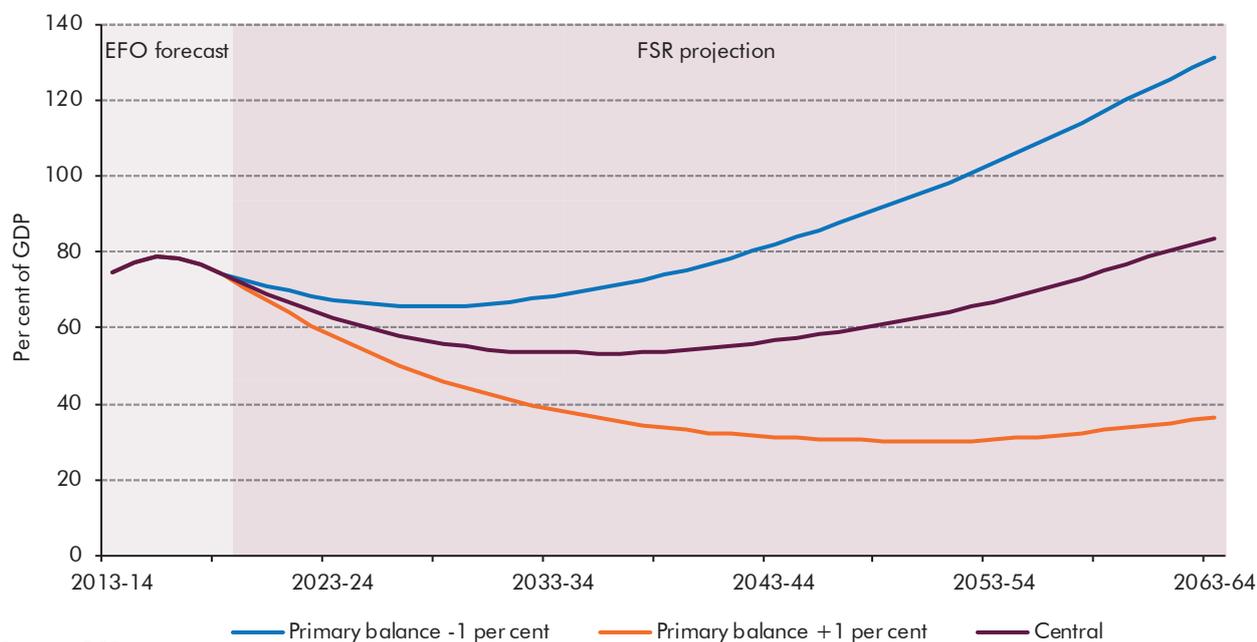
3.81 This section analyses the sensitivity of our central projections to the medium-term fiscal position and to our key demographic and economic assumptions.

### Sensitivity to the medium-term primary balance

3.82 Our March *EFO* forecast for 2018-19 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.

3.83 Chart 3.13 shows that if the primary balance from 2019-20 onwards was worse by 1 per cent of GDP than in our March forecast, then by the end of the period net debt would increase to around 130 per cent of GDP rather than 84 per cent in our central projections. Conversely, a structural primary balance that was 1 per cent of GDP better in 2019-20 would see debt fall to just over 30 per cent of GDP before beginning to rise again.

Chart 3.13: Sensitivity of net debt projections to the primary balance in 2019-20



Source: OBR

### Sensitivity to the composition of spending in 2018-19

- 3.84 Chart 3.13 assumes that a 1 per cent of GDP difference in the initial primary balance persists in all future years. But the composition also matters, and so that margin may be expected to widen or narrow depending on the underlying factors at play.
- 3.85 In the absence of detailed spending plans beyond 2015-16, there are now three 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 2018-19, to which our results will be sensitive.
- 3.86 Our central projection assumes that all types of departmental spending fall proportionately over these three years. This implies health and education spending, the main age-related elements of departmental spending, being reduced by 1.1 per cent and 0.7 per cent of GDP respectively between 2015-16 and 2018-19 (equivalent to £23 billion and £15 billion in nominal terms in 2018-19).<sup>7</sup>
- 3.87 Alternatively we could assume for these three years, as we do beyond 2018-19, 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 three years. The Government would then have to find cuts in other spending of 1.9 per cent of GDP (£39 billion in nominal terms in 2018-19) to stick to its announced policy assumption for total spending. As shown in Tables 3.14 and 3.15, the effect on the projections of higher spending on education in 2018-19 would be minimal, but higher

<sup>7</sup> Our long-term projections are based on assumptions about the functional split of spending in 2018-19, as described in the policy assumptions section of this chapter.

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health spending in 2018-19 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 2063-64. Chart 3.14 shows that on this alternative interpretation of unchanged policy towards departmental spending, net debt would rise to 97 per cent of GDP by 2063-64 in the absence of any offsetting changes to other spending or to tax levels.

Table 3.14: Non-interest spending projections, assuming age-related spending beyond 2015-16

	Per cent of GDP							
	Estimate <sup>1</sup>		FSR Projection					
	2013-14	2018-19	2020-21	2023-24	2033-34	2043-44	2053-54	2063-64
Health	7.9	7.6	7.7	8.0	8.9	9.5	10.0	10.1
Long-term care	1.2	1.2	1.4	1.4	1.7	2.0	2.2	2.3
Education	5.3	5.0	5.0	5.1	5.1	4.9	5.0	4.9
State pensions	5.8	5.5	5.4	5.7	6.7	7.4	7.6	7.9
Pensioner benefits <sup>2</sup>	1.0	0.8	0.8	0.8	0.9	1.0	1.0	0.9
Public service pensions	2.2	2.2	2.1	2.1	1.9	1.6	1.4	1.2
<b>Total age-related spending</b>	<b>23.3</b>	<b>22.4</b>	<b>22.5</b>	<b>23.2</b>	<b>25.2</b>	<b>26.4</b>	<b>27.1</b>	<b>27.4</b>
Other welfare benefits <sup>2</sup>	5.8	5.2	5.3	5.3	5.2	5.2	5.3	5.3
Other spending <sup>2</sup>	11.4	6.7	6.8	6.6	6.6	6.6	6.8	6.8
<b>Spending<sup>3</sup></b>	<b>40.5</b>	<b>34.3</b>	<b>34.6</b>	<b>35.1</b>	<b>37.0</b>	<b>38.2</b>	<b>39.2</b>	<b>39.5</b>

<sup>1</sup> Total spending is consistent with the March 2014 *Economic and fiscal outlook*.

<sup>2</sup> Last year's pensioner and welfare benefits projections included council tax benefit. This has now been devolved to local authorities, and so is excluded from our benefits projections, and is now implicitly included in 'other spending'.

<sup>3</sup> Excludes interest and dividends.

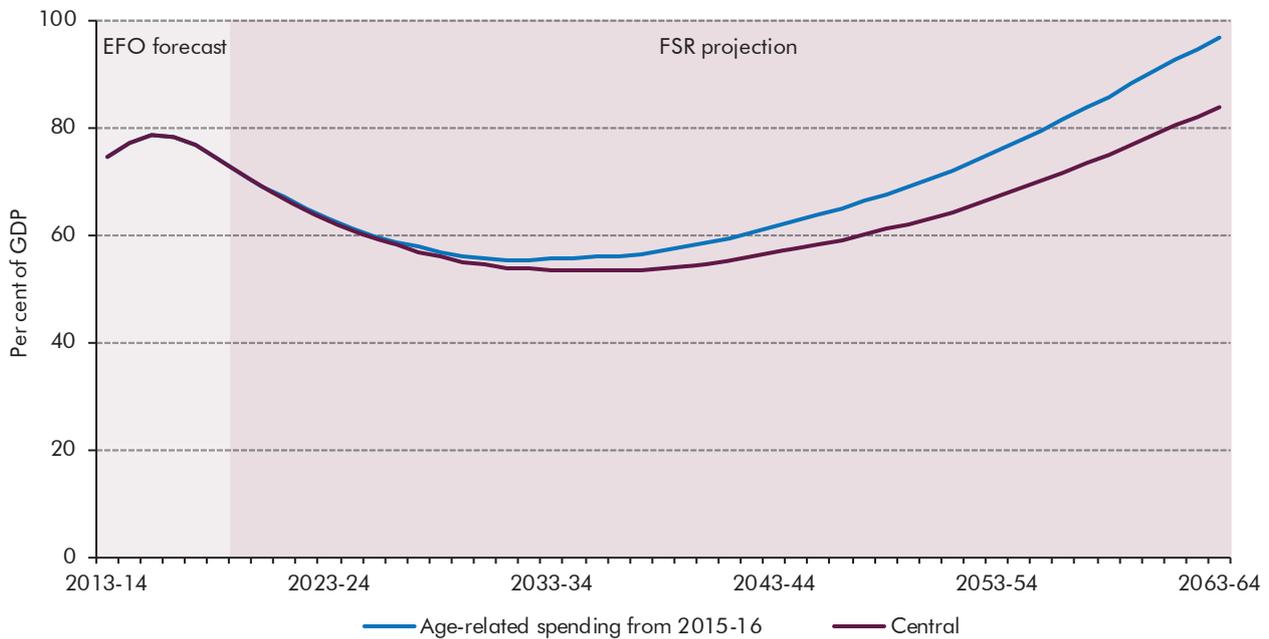
Table 3.15: Differences from central projection for non-interest spending, assuming age-related spending beyond 2015-16

	Per cent of GDP							
	Estimate <sup>1</sup>		FSR Projection					
	2013-14	2018-19	2020-21	2023-24	2033-34	2043-44	2053-54	2063-64
Health	0.0	1.2	1.2	1.3	1.4	1.5	1.6	1.6
Long-term care	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Education	0.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7
State pensions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pensioner benefits	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public service pensions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total age-related spending</b>	<b>0.0</b>	<b>1.9</b>	<b>1.9</b>	<b>2.0</b>	<b>2.1</b>	<b>2.2</b>	<b>2.3</b>	<b>2.3</b>
Other welfare benefits	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other spending	0.0	-1.9	-1.9	-1.9	-1.9	-1.9	-1.9	-1.9
<b>Spending<sup>2</sup></b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>	<b>0.2</b>	<b>0.3</b>	<b>0.4</b>	<b>0.4</b>

<sup>1</sup> Total spending is consistent with the March 2014 *Economic and fiscal outlook*.

<sup>2</sup> Excludes interest and dividends.

Chart 3.14: Sensitivity of net debt projections to our assumption on the allocation of spending beyond 2015-16

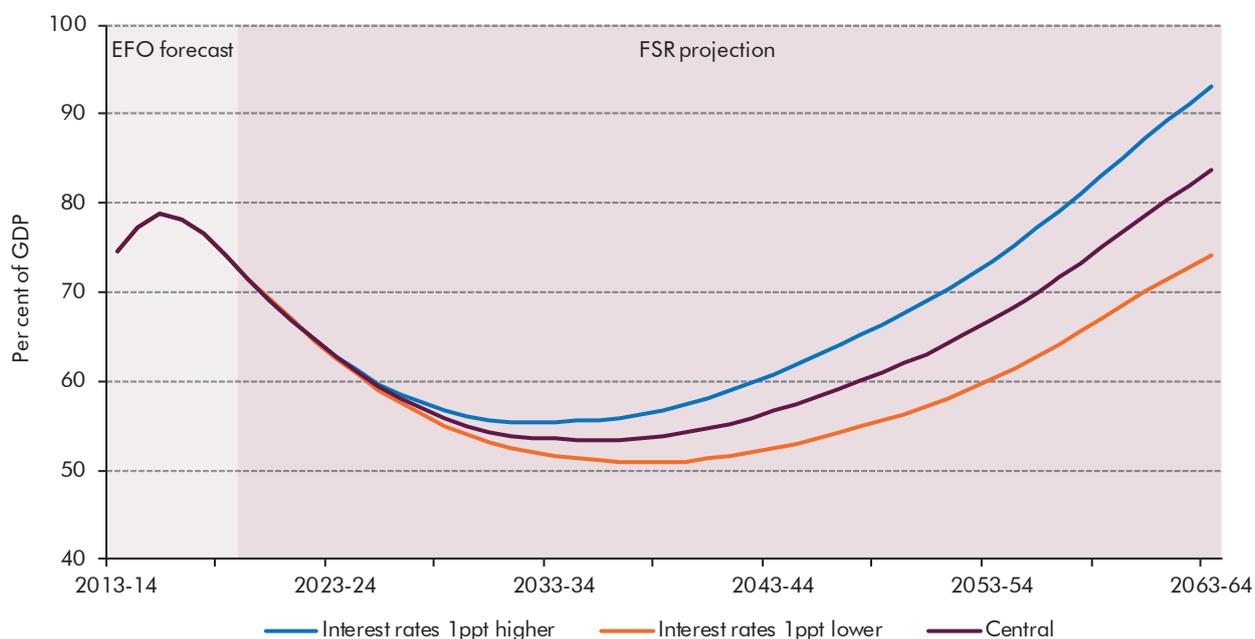


Source: OBR

### Sensitivity to interest rates

- 3.88 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. This is higher than market expectations currently imply for the long term. But gilt rates could end up higher than assumed, for example if demand for safe assets falls as economic uncertainty recedes, or if the markets have not fully priced in withdrawal of QE.
- 3.89 Chart 3.15 illustrates the path of net debt if gilt rates were 1 percentage point higher or lower from 2019-20 onwards. 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 gather pace. 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. This sensitivity is smaller than projected last year, given the lower level of debt in the central projection and that we have raised our projection for the stock of interest bearing assets held by the public sector, which we assume would also yield a higher or lower return if interest rates were to vary.

Chart 3.15: Sensitivity of net debt projections to interest rates



Source: OBR

### Sensitivity to demographic assumptions

3.90 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 3.16, which shows the differences in non-interest receipts and spending compared to our central projection, and Chart 3.16, which shows the impact on public sector net debt.

3.91 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 ‘long-term balanced migration’ (referred to as ‘zero net migration’ in last year’s report) – plus a new ‘high tens of thousands’ migration scenario used for the first time this year, which assumes long-term migration settles at 90,000 a year. As Box 3.3 illustrated, net migration has proved one of the biggest source of errors in past population projections. In 2013 as a whole, net migration reached 212,000, which is closer to the high migration variant than either the ONS principal variant or the low migration variant used in our central projection.

3.92 The ‘old age structure’ scenario uses the same long-term net migration assumption as our central projection, but combined with lower fertility and higher life expectancy. Linking SPA changes to life expectancy would imply 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 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.

- 3.93 On these assumptions, the primary balance would be in a better position until the 2050s than in our central projection. Spending on education and welfare payments to pensioners (mainly state pension) would be lower as a share of GDP, while the upward pressures on health and long-term care would be partly matched by higher output. Cash receipts would also be higher, but the effective tax rate would probably 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 the fiscal position ultimately less sustainable. 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.
- 3.94 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, in contrast to the flat trajectory 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 balance remains in surplus and so net debt continues to fall throughout, falling below 40 per cent of GDP by 2063-64.
- 3.95 The migration scenarios illustrate that migration reduces upward pressure on debt over our 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. We discussed the impact of net migration on our long-term projections in detail in Annex A of last year’s report and Box 3.4 provides a brief recap of its conclusions, as well as clarifying what we have considered in this report and what is beyond our scope.
- 3.96 The downward revision to net inward migration in our central projection weakens the fiscal outlook somewhat relative to last year, although we cannot quantify the effect precisely relative to the other changes to the population projections. The fiscal impact of net migration is less positive for two reasons. First, changes in age-specific net migration assumptions reduce the positive fiscal impact per net migrant because the latest projections imply that inward migrants spend a smaller proportion of their working lives in the UK. Second, that positive fiscal impact is applied to a smaller number of net migrants. However, this also interacts with the increase to long-term fertility rates – which implies a younger distribution for the following cohort – and the census update – which implies the future demographic pattern assuming a static population is less favourable.
- 3.97 Our central projection assumes net inward migration of 105,000 a year. We estimate that reducing this to the ‘high tens of thousands’ (90,000 a year, for the purposes of illustration) would increase the primary budget deficit by 0.2 per cent of GDP and net debt by 6 per cent of GDP by 2063-64, relative to our central projection. 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 last decade – then we estimate that this would reduce the primary budget deficit by 1.2 per cent of GDP and net debt by 42 per cent of GDP by 2063-64, relative to our central projection.

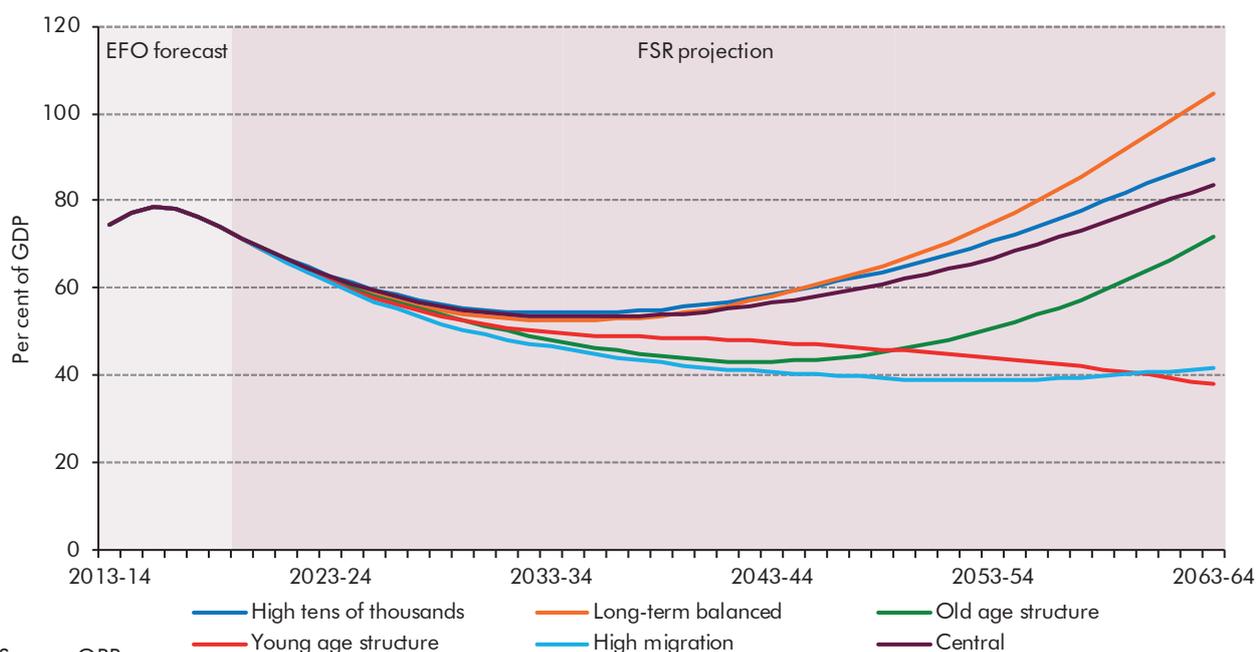
The fiscal impact of future government activity:  
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3.98 The ‘long-term balanced’ migration variant assumes zero net, but not necessarily gross, migration flows from the mid-2030s onwards. We include this not because it is a realistic policy outcome, but because it helps illustrate the impact on fiscal sustainability of the demographic trends affecting the current UK population. The projections through to the 2030s are relatively similar to our central projections, but with the primary budget deficit 1.2 per cent of GDP larger and net debt 21 per cent of GDP higher by 2063-64.

Table 3.16: Non-interest receipts and spending for demographic variants

	Difference from central projection, per cent of GDP							
	EFO forecast		FSR projection					
	2013-14	2018-19	2020-21	2023-24	2033-34	2043-44	2053-54	2063-64
<b>Old age structure</b>								
Receipts	0.0	0.0	0.0	-0.1	-0.6	-0.9	-1.1	-1.2
Spending	0.0	0.0	-0.1	-0.2	-1.4	-1.4	-1.0	-0.2
<b>Young age structure</b>								
Receipts	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	0.3
Spending	0.0	0.0	0.0	-0.1	-0.2	-0.9	-1.6	-2.1
<b>High migration</b>								
Receipts	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1
Spending	0.0	0.0	-0.1	-0.2	-0.5	-0.9	-1.3	-1.3
<b>Long-term balanced</b>								
Receipts	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.4
Spending	0.0	0.0	0.0	-0.1	0.1	0.4	0.8	1.6
<b>High tens of thousands</b>								
Receipts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spending	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2

Chart 3.16: Sensitivity of net debt projections to demographic variants



### Box 3.4: Migration and fiscal sustainability

In last year's *FSR*, we looked in detail at migration and the sustainability of the public finances. This prompted a number of questions from interest groups and the public. This box summarises the migration-related issues that we consider explicitly in our long-term projections, those that are implicit in the material we use to produce them, and, importantly, those issues we do not consider – either because they are beyond the scope of our modelling techniques or because they fall outside the OBR's remit from Parliament.

The issue we address most explicitly in our projections is the effect of net migration on the dependency ratio and how that feeds through to the public finances over a 50-year horizon. To do this, we take the detailed ONS population projections and apply age-specific tax and spending profiles to track the effect of the change in population structure on the fiscal position. We use the ONS low migration variant as our central projection, which assumes net inward migration averaging 105,000 a year. This assumes that net inward migration will be lower on average than in recent years, which seems consistent with the international environment and with the Government's declared efforts to reduce it. But it is not as low as the 'high tens of thousands' Ministers aspire to, reflecting the fact that net migration flows are not directly controllable by the Government and that their efforts to date have not been as successful as they hoped.

Implicit in the ONS population projections is that migrants, once in the UK, will on average exhibit the same fertility rates and probability of future emigration as the population at large. We considered the issue of fertility rates last year, concluding that while the evidence points to somewhat higher fertility rates among non-UK born women, the impact is likely to be small. Over a 50-year horizon, higher fertility rates support the public finances due to the effect on the dependency ratio; that would reverse over even longer horizons.

We need to make a number of other assumptions about the migrant population to produce our projections. For example, we assume that the age-specific tax and spending profiles underpinning our broader projections are also applicable to migrants and that migrants will on average have the same age-specific employment rates and productivity. We explored some of these assumptions last year, finding no convincing evidence to the contrary, but noting again that there was a lot of variation across migrants of different types.

The conclusion we draw from these projections is that because the age structure of inward migrants to the UK is skewed towards those of working-age, net migration reduces the dependency ratio over our 50-year horizon and thus reduces age-related pressures on the public finances. This finding is not unique to the UK; for example, the US CBO's analysis of the economic impact of higher net immigration noted the effects on GDP via the labour force, among other factors.<sup>a</sup>

It is important to emphasise that just because we find that higher net inward migration is likely to improve the long-term fiscal position, that does not mean that we are recommending that the Government aims for more inward migration rather than less – this judgement lies outside our remit and for those that have to make it there are clearly other factors to consider beyond the impact of migration on the public finances via the age structure of the population.

It is also wrong to conclude from our analysis that the Government has to accept higher inward

migration in order to put or to keep the public finances on a sustainable path. If a government succeeded in reducing net inward migration from what would otherwise occur then that would be likely to create additional fiscal pressures, but it could always choose to offset those pressures through additional spending cuts or tax increases.

Following last year's report, a number of reasons were suggested as to why the results shown in our projections might not hold or why they might be misleading when considering the issue of migration more broadly. For example, we were asked:

- whether we took account of the fact that inward migrants will age. This is taken into account implicitly via the ONS population projections and the age-specific tax and spending profiles that underpin our projections. The long-term balanced migration variant, with positive net inward migration early in the projection falling to zero net migration thereafter, in effect illustrates the fiscal implications of the boost to the working-age population from net migrants diminishing while the resident population, both UK-born and foreign-born, continues to age;
- whether we considered the pressure on housing supply given the UK is a 'small crowded island'. We do not consider this directly. Implicit in our projections is that the availability of housing will match needs. More generally, evidence suggests that restrictions on housing supply relate more to policy restrictions via the planning system than a genuine shortage of land for building;<sup>b</sup>
- whether we took into account the fact that immigrants increase pressure on public services and the resulting cost pressures. It is important to remember that in most areas of public services we assume that spending per person is held constant as a share of GDP. We assume that net inward migration increases GDP and therefore increases cash and real spending on public services proportionately. (Indeed we assume that net inward migration also modestly increases *per capita* GDP on average, as inward migrants are more likely to be of working age than the native population.) To illustrate, our projections imply that the UK public sector would spend an additional £33 billion in today's prices on health in 2063-64 under the high migration scenario and spend £4 billion less under the 'high tens of thousands' variant. Our analysis, and that of a number of academics, suggests that across the whole economy inward migration adds more to revenue than to expenditure.<sup>c</sup> But does the revenue raised from more working-age migrants get spent in the places where they and their families use public services alongside the native population? This is an important policy issue, but lies outside the OBR's remit; and
- whether we reflected on broader societal issues such as the assimilation of migrant communities. Again this is an important policy issue, but one that lies beyond the OBR's remit. It is one of the issues that policymakers doubtless need to consider when they are developing migration policy, alongside the narrowly fiscal issues on which we are qualified to comment.

<sup>a</sup> CBO (2013)

<sup>b</sup> See for example Cheshire (2014) and Hibler and Vermeulen (2014).

<sup>c</sup> See for example Lisenkova *et al* (2013) and Dustmann and Frattini (2013).

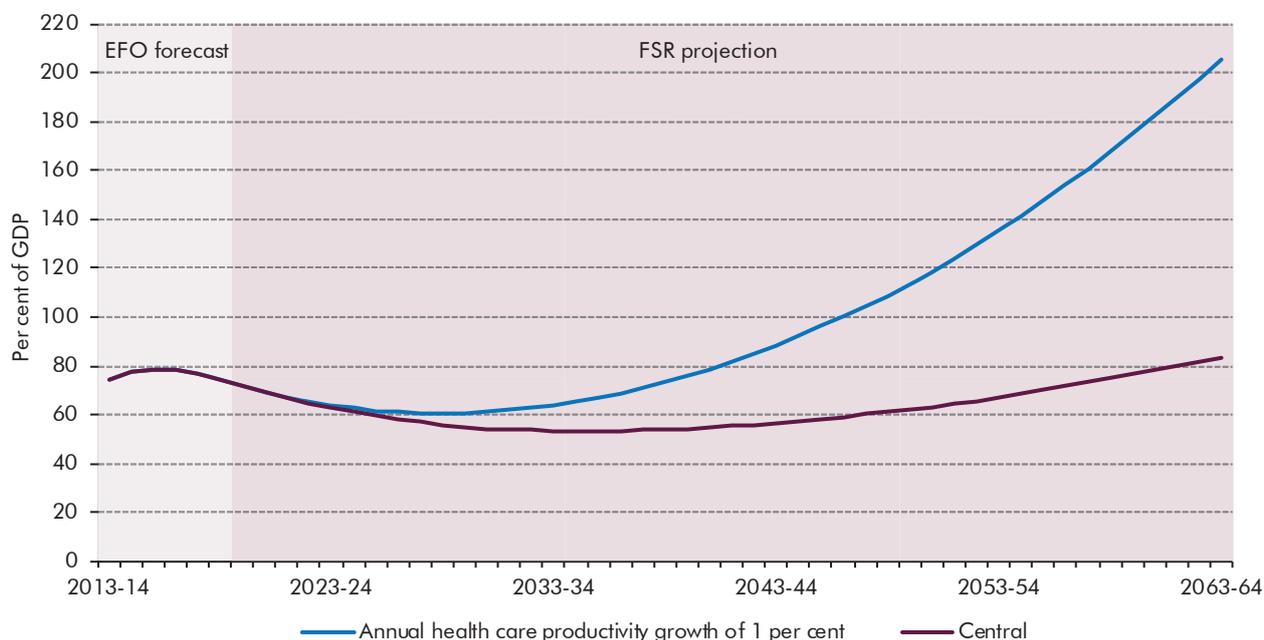
### Sensitivity to alternative health sector productivity

- 3.99 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 *FSR 2012*. 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 2018-19, the starting point for the projections.
- 3.100 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 by the same amount 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.<sup>8</sup> 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.
- 3.101 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 1.0 per cent a year on average between 1979 and 2010. Rolling this forward would imply that real health spending per person would need to rise by 3.4 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 2063-64 rise by around 5.9 per cent of GDP relative to our central projection and would imply a significantly higher path for net debt over the projection period, as shown in Chart 3.17.

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<sup>8</sup> Baumol (1966).

Chart 3.17: Sensitivity of net debt projections to lower productivity in the health care sector



Source: OBR

## Conclusion

- 3.102 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 illustrated some of the uncertainties through sensitivity analyses.
- 3.103 As with our projections in previous *FSRs*, these uncertainties should not be used to disguise the fact that in most of these scenarios 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 note 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.
- 3.104 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. The UK is far from unique in facing such pressures.
- 3.105 While these overall conclusions are similar to last year's, the outlook has improved over the medium term with public sector net debt now projected to peak at 79 per cent of GDP in 2015-16, a year earlier and 7 per cent of GDP lower than in last year's *FSR*. But the

improvement by that point is mainly cyclical. The Government has also chosen to continue cutting spending for a further year, in 2018-19, and to link future changes in the State Pension age to life expectancy. One way to interpret these policy changes would be as contributions to the need for long-term fiscal adjustment that we identified last year. But the latest demographic projections offset much of the relative improvement in the primary balance that they deliver. By the end of the long-term horizon, the primary deficit is only 0.2 per cent of GDP smaller than we projected last year at 1.7 per cent of GDP.

- 3.106 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.
- 3.107 Before that, in Chapter 4, we look more closely at the sustainability of tax revenues. The central projections in this chapter only consider the impact of demographic pressures on government revenues. In the next chapter, we update our work on non-demographic trends that are likely to affect revenues from the North Sea and from transport taxes.

# 4 The sustainability of tax revenues

## Introduction

4.1 The long-term projections presented in Chapter 3 assume a constant ratio of tax revenue to GDP, except for changes driven by demography (which are relatively small). This is consistent with most international examples of sustainability analysis. Making this assumption helps highlight the fiscal challenge created by future spending pressures, but it is also useful to consider non-demographic factors that are likely to increase or decrease some tax streams as a share of GDP over the coming decades.

4.2 In previous *Fiscal sustainability reports (FSRs)* and *Economic and fiscal outlooks (EFOs)* we have highlighted a number of non-demographic factors that may affect the sustainability of tax revenues:

- **technological developments** could affect receipts from fuel duty as innovation in engine design and fuel efficiency reduce fuel consumption. VAT receipts could also be affected if advances in technology continue to drive down the relative price of consumer durables, which are generally subject to the standard rate of VAT;
- oil and gas revenues continue to decline as the supply of these **natural resources** is gradually depleted. But new resources, such as shale gas, could provide new sources of revenue;
- **long term behavioural change** may affect revenues from a number of taxes, such as tobacco and alcohol duties, vehicle excise duty and some taxes that are designed to encourage greener energy production. Many of these taxes are designed to encourage or discourage particular choices or behaviour, so if successful in changing behaviour, will produce less tax revenue over time;
- some aspects of **globalisation** could affect the pattern of revenues from individual taxes such as corporation tax and VAT. Increased mobility of capital could affect receipts via decisions by multinational companies on where to declare profits. Globalisation could also affect VAT receipts, through changing consumption patterns and relative prices, for example between more expensive energy and cheaper manufactured goods;
- **compliance** with the tax system can affect the sustainability of revenues. Over time, policy aims to close tax avoidance loopholes, but the effectiveness of such measures generally erodes over time as new avoidance schemes are created;

- the **structure of the tax system** and its interaction with long-term economic trends. For example, fiscal drag in the income tax system, where thresholds and allowances are updated in line with inflation, but average earnings typically rise at a faster rate, thereby 'dragging' taxpayers into higher tax bands. We discuss the effect of fiscal drag on income tax and NICs in Box 3.2 in Chapter 3. Similar effects occur wherever rates or thresholds are updated by less than trends in the tax base. So receipts from stamp duty land tax and inheritance tax, where the value of houses and other assets typically rise faster than thresholds (which are currently fixed in nominal terms), rise as a share of GDP as the average tax rate increases; and
- the **structure of the economy** more generally will affect the sustainability of revenues. The sectoral split by industry, trends in the labour and capital shares of national income, the share of consumer spending in the economy and the structure of the labour market all have different implications for the tax richness of activity in the whole economy.

4.3 In our 2011 *FSR* we looked in detail at the effect of non-demographic factors on income tax and NICs, transport taxes, environmental taxes, oil and gas revenues and tobacco duties. We have revisited our analysis of oil and gas revenues in each *FSR*, while in 2012 we also looked at the effect of globalisation on corporation tax and VAT revenues and last year we considered the effects of rising participation in the labour market by older people.

4.4 Table 4.1 presents our latest medium-term receipts forecast from the March 2014 *EFO*. Some receipts streams are expected to fall as a share of GDP even over this 5-year horizon. In the rest of this chapter, we consider longer-term prospects for three of the tax streams that are forecast to fall as a share of GDP over the next 5 years: oil and gas revenues, fuel duty and vehicle excise duty.

Table 4.1: Medium-term receipts as a per cent of GDP

	Per cent of GDP						
	Outturn	Forecast					
		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Income tax and NICs	16.4	16.0	16.1	16.3	16.8	17.0	17.2
Value added tax	6.4	6.5	6.4	6.4	6.4	6.3	6.3
Onshore corporation tax	2.3	2.2	2.3	2.2	2.2	2.2	2.1
UK oil and gas receipts	0.4	0.3	0.2	0.2	0.2	0.2	0.2
Fuel duties	1.7	1.6	1.6	1.5	1.5	1.5	1.5
Business rates	1.7	1.6	1.6	1.6	1.6	1.6	1.6
Council tax	1.7	1.7	1.6	1.6	1.5	1.5	1.5
Excise duties	1.3	1.2	1.2	1.2	1.2	1.2	1.2
Capital taxes	1.0	1.2	1.5	1.6	1.7	1.7	1.8
Vehicle excise duty	0.4	0.4	0.3	0.3	0.3	0.3	0.3
Other taxes	2.3	2.5	2.5	2.6	2.5	2.5	2.4
<b>National Accounts taxes</b>	<b>35.5</b>	<b>35.2</b>	<b>35.2</b>	<b>35.5</b>	<b>35.8</b>	<b>35.9</b>	<b>35.9</b>
Interest and dividend receipts exc. APF	0.5	0.4	0.4	0.5	0.7	0.7	0.8
Other receipts	1.4	1.3	1.3	1.3	1.3	1.3	1.3
<b>Current receipts exc. APF</b>	<b>37.4</b>	<b>37.0</b>	<b>37.0</b>	<b>37.4</b>	<b>37.8</b>	<b>38.0</b>	<b>38.1</b>
APF dividend receipts	0.4	0.7	0.7	0.4	0.2	0.0	0.0
<b>Current receipts</b>	<b>37.8</b>	<b>37.7</b>	<b>37.7</b>	<b>37.8</b>	<b>38.0</b>	<b>38.0</b>	<b>38.1</b>

4.5 Prospects for **North Sea oil and gas receipts** have been an issue of considerable interest in the lead up to the Scottish independence referendum in September 2014. In this report, we consider a wide range of scenarios, which illustrate both the broad trends that can be expected and the uncertainty that surrounds any such projections. All of the scenarios show a long-term decline in this revenue stream as a result of the exhaustion of the natural resources remaining within the UK continental shelf.

4.6 **Transport taxes** fall as a per cent of GDP over the medium term due mainly to improvements in the fuel efficiency of new vehicles. We have re-assessed the long-term projections for transport taxes under a number of fuel efficiency scenarios.

## Oil and gas revenues

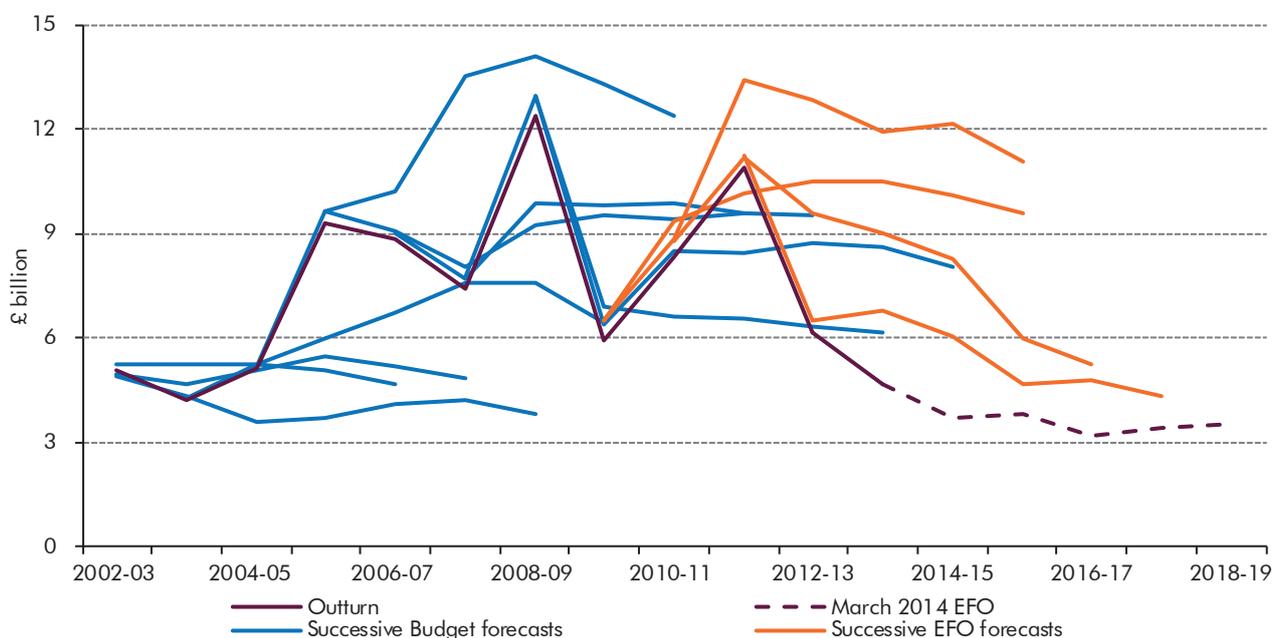
### The medium-term forecast

4.7 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, 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.<sup>1</sup>

4.8 Chart 4.1 shows the path of oil and gas receipts since 2002 and the successive official forecasts that have been published at each Budget 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 nearly 35 per cent – compared with just 5 per cent for income tax or 7 per cent for VAT. In recent years, this volatility has primarily reflected fluctuations in production and expenditure. Earlier in the period oil price movements explained more of the volatility.

Chart 4.1: Oil and gas receipts: outturns and forecasts



Source: HM Treasury, OBR, HMRC

4.9 The forecast lines are distributed both above and below the outturn path of receipts, which demonstrates that official forecasts have been neither systematically too optimistic nor systematically too pessimistic over the period as a whole. Towards the end of the period, the OBR’s four Budget forecasts have been too optimistic, as receipts grew by less than we expected in 2010-11 and 2011-12 and then more than halved over the subsequent two years. Indeed, the £4.7 billion raised in 2013-14 was less than had been predicted in all six Budget forecasts that had included a forecast for that year.

4.10 Looking forward, the starting point for our long-term oil and gas revenue projections is our March EFO forecast. This showed revenues falling from £6.1 billion in 2012-13 to £3.5 billion in 2018-19. That forecast for 2017-18 was almost £1 billion down on last year, largely reflecting lower-than-expected oil and gas production in 2013 that pushed down the forecast level of production in subsequent years. Since last year’s FSR, our oil and gas

<sup>1</sup> For discussion of the challenge of forecasting oil prices, see for example Reichsfeld and Roache (2011) and Nixon and Smith (2012).

revenue forecast for the period from 2013-14 to 2018-19 has been revised down by a cumulative £8.0 billion. 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 are assumed to follow a path consistent with the uncovered interest parity condition, which relates exchange rate movements to interest rate differentials;
- production follows Department of Energy and Climate Change (DECC) estimates, which are broadly flat over the forecast period;<sup>2</sup>
- capital and operating expenditure also follows DECC projections; and
- some firms in the industry have accumulated losses that they would be able to carry forward and set off against future profits before paying tax.

4.11 Table 4.2 shows the changes in the main determinants of our medium-term forecast since last year's *FSR*. The forecast for dollar oil prices is slightly higher towards the end of the period than last year. This partly reflects our updated methodology, where we now use just the first two years of the oil price futures curve, rather than for the whole 5-year period. But, while the dollar oil price is slightly higher, the appreciation of sterling means that the sterling oil price is slightly lower than last year. Gas prices are forecast to be higher in 2017-18 than in last year's report, again reflecting our updated methodology. Production has fallen more rapidly than we expected last year: oil production is forecast to be around 11 per cent lower and gas production around 8 per cent lower by 2017-18 than we forecast last year.

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<sup>2</sup> Department of Energy and Climate Change (2014)

Table 4.2: Changes in the medium-term determinants

	2012	2013	2014	2015	2016	2017
<b>March 2013 EFO</b>						
Oil prices (\$ per barrel)	112.0	113.4	106.3	100.8	96.7	92.9
Oil prices (£ per barrel)	70.6	73.4	68.8	65.2	62.5	60.1
Gas prices (p/therm)	59.1	68.6	68.0	63.9	60.9	58.3
Oil production (million tonnes)	44.5	44.4	44.3	44.1	44.0	43.9
Gas production (billion therms)	13.8	14.1	14.0	13.9	13.9	13.8
<b>March 2014 EFO</b>						
Oil prices (\$ per barrel)	112.0	108.8	107.5	102.0	99.3	99.3
Oil prices (£ per barrel)	70.6	69.6	64.7	61.1	59.2	59.0
Gas prices (p/therm)	59.1	66.9	60.2	63.2	63.2	63.2
Oil production (million tonnes)	44.5	40.6	39.2	39.2	39.2	39.2
Gas production (billion therms)	13.8	12.8	12.8	12.7	12.7	12.7
<b>Change</b>						
Oil prices (\$ per barrel)	0.0	-4.6	1.2	1.2	2.5	6.4
Oil prices (£ per barrel)	0.0	-3.8	-4.1	-4.1	-3.3	-1.1
Gas prices (p/therm)	0.0	-1.7	-7.8	-0.7	2.3	4.9
Oil production (million tonnes)	0.0	-3.8	-5.1	-4.9	-4.8	-4.7
Gas production (billion therms)	0.0	-1.3	-1.2	-1.2	-1.2	-1.1

All prices in nominal terms. Determinants are on a calendar year basis, but relate to receipts in the corresponding financial year (i.e. 2012-13 receipts relate to determinants in 2012).

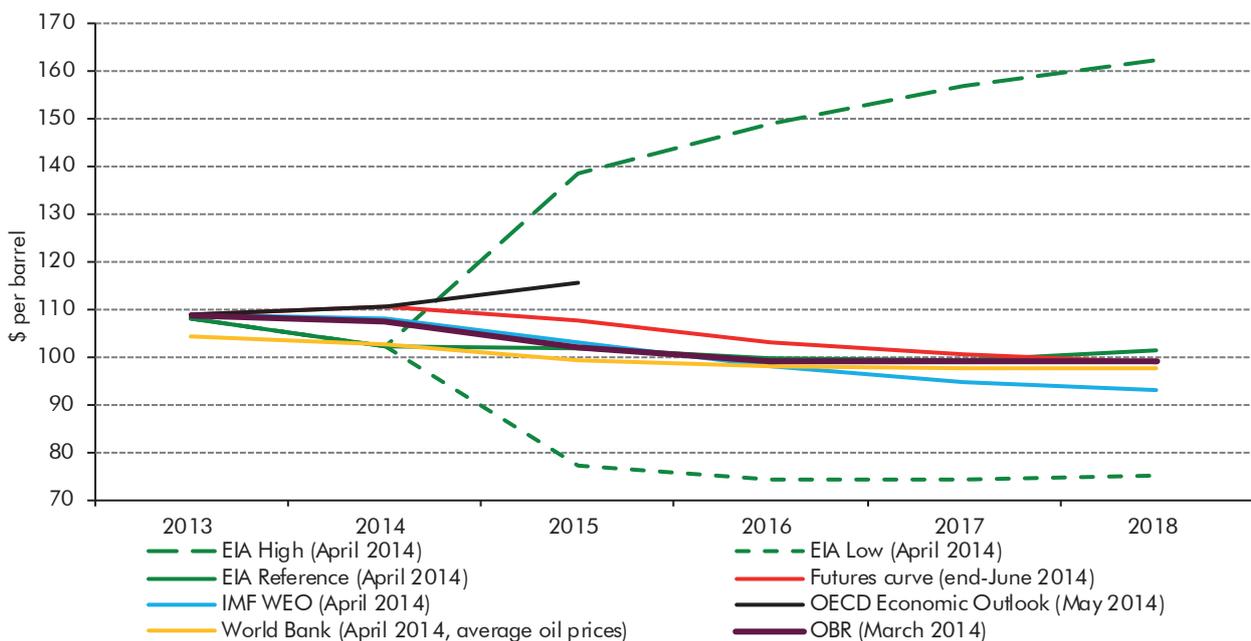
## Prices

- 4.12 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, geopolitical events and speculative demand – all of which are difficult to predict with any accuracy, even over very short time horizons.
- 4.13 We assume that oil and gas prices move in line with their future 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”.<sup>3</sup>
- 4.14 Chart 4.2 shows a range of recent short-to-medium-term forecasts for oil prices from external sources. Many of these are similar to the medium-term forecast we made in March, in some cases because they also utilise information from futures markets and those markets have not moved a great deal over the subsequent three months. Specifically:

<sup>3</sup> Reichsfeld and Roache (2011)

- the IMF uses a futures based forecast for the projections in its World Economic Outlook;<sup>4</sup>
- the OECD assumes that prices increase by \$5 a barrel each year, from the latest quarter of outturn prices;<sup>5</sup>
- the US Energy Information Administration (EIA) produces a range of oil price scenarios, based on judgements on demand and supply.<sup>6</sup> The 'Low oil price' scenario is based on lower costs of production and lower demand from China and the Middle East than the 'reference case', as well as detailed interactions between OPEC and non-OPEC supply. The 'High oil price' scenario reflects higher costs of supply from non-conventional resources; and
- the World Bank forecast for oil prices is also based on judgements about demand and supply. While the World Bank measure is based on an average of Brent, Dubai and West Texas Intermediate crude oil prices, it declines at a rate similar to the majority of forecasts in this comparison. The World Bank notes that in the longer term "prices are expected to fall due to growing supplies of unconventional oil, efficiency gains, and (less so) substitution away from oil".<sup>7</sup>

Chart 4.2: Medium-term oil price forecasts



Source: OBR, IMF, OECD, World Bank, Thomson Reuters, EIA, HM Treasury

<sup>4</sup> IMF (2014)

<sup>5</sup> OECD (2014)

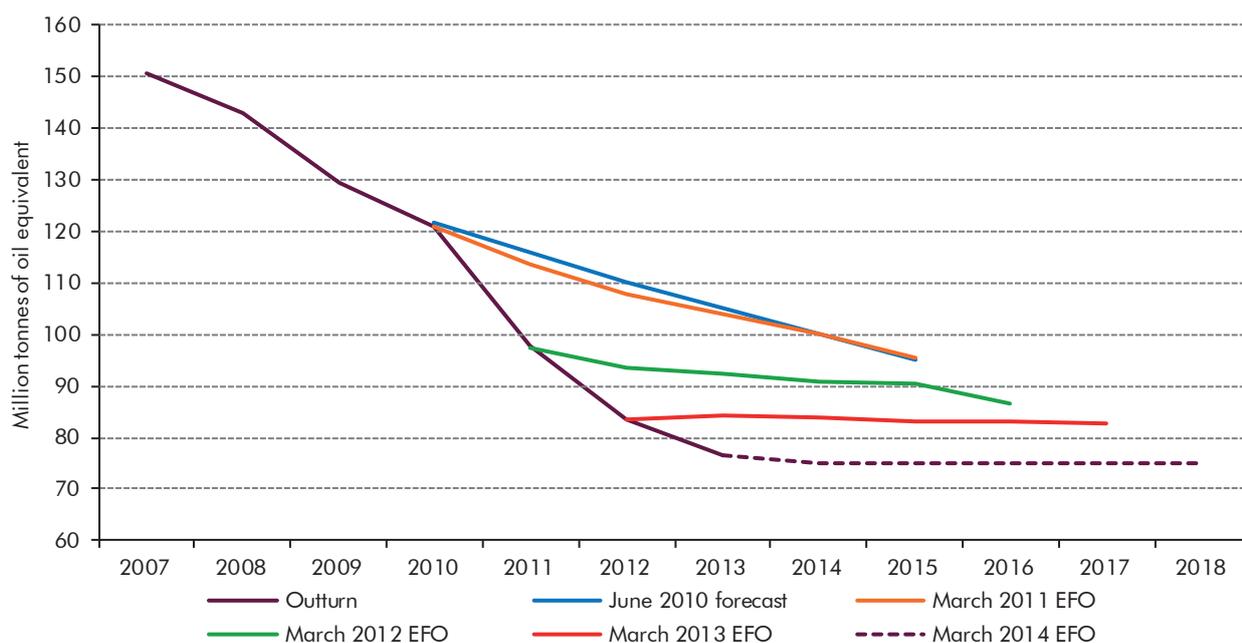
<sup>6</sup> Energy Information Administration (2014)

<sup>7</sup> World Bank (2014)

## Production

- 4.15 North Sea oil and gas production has fallen each year since 1999, by 7.8 per cent a year on average. But our central forecast for production is essentially flat between 2014 and 2018, reflecting the expected returns from very high levels of investment in recent years. Oil & Gas UK, the industry’s main UK trade association, forecasts that production will rise by about 20 per cent over these five years, but even that would only take production back to the average level of 2011 and 2012.
- 4.16 As set out above, we make use of the DECC oil and gas production projections for our medium-term forecast. These are compiled using field-level data provided to 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 DECC production forecasts are consistently lower than the industry predicts, they have still tended to be overoptimistic, as Chart 4.3 shows.

Chart 4.3: Production forecasts and outturns



Source: DECC, OBR

## Long-term projections

- 4.17 Our long-term projections are based on the same methodology as in previous years. We commissioned HMRC to run their oil and gas revenue model to extend their medium-term forecast to 2040-41. The model estimates revenues at 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.
- 4.18 Beyond the medium-term forecast, from 2019 onwards, we assume that:

- nominal oil and gas prices rise in line with our long-term assumption for whole economy inflation (2.2 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 1999;
- real operating and capital expenditure move in line with production; and
- decommissioning expenditure is as reported by operators.

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

4.20 As in previous reports, we have not included the effect on receipts of the potential development of the UK's shale gas resources. 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.<sup>8,9</sup> The timing of any potential commercial extraction of this activity is also too uncertain at this point to quantify with any accuracy. A recent report by EY for the UK Onshore Operators Group estimated that the shale industry would need to spend £33 billion to bring shale wells into production between 2016 and 2032.<sup>10</sup> Overall, shale gas production holds potentially large upside risks for the Exchequer. However, 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 do not explicitly take account of the effect of increased supply from shale gas extraction.

4.21 Chart 4.4 shows our long-term projections for receipts, which have been revised lower since last year. They continue to show a long-term decline over time. Revenues are expected average around 0.06 per cent of GDP between 2019-20 and 2040-41, around a fifth of the level recorded in 2013-14. Expected revenues over this period total £39.3 billion, down £12.6 billion from our estimate last year. Of this downward revision:

- around £9 billion reflects a downward revision to expected production. As we discussed above, unexpectedly weak production in 2013 has prompted us to revise down our medium-term forecast for receipts over the past year. This knocks through to the long-term projections;
- around £1 billion reflects the combined effect of lower sterling oil prices, which reduced receipts, and higher gas prices which partly offset this fall; and
- around £6 billion reflects updated information across a number of elements of the projections. The individual elements cannot be quantified precisely but they include:

<sup>8</sup> British Geological Survey and Department of Energy and Climate Change (2013)

<sup>9</sup> British Geological Survey and Department of Energy and Climate Change (2014)

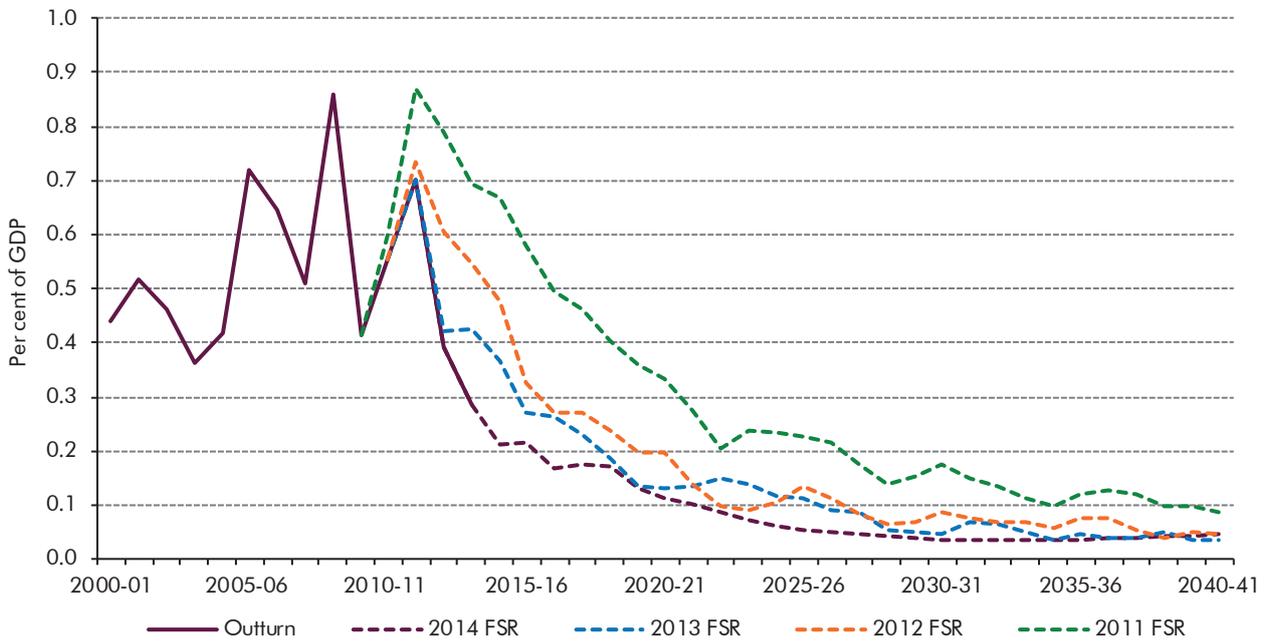
<sup>10</sup> EY (2014)

- the incorporation of the latest data on field ownership and the group structure of operating companies. This has reduced projected receipts for two main reasons: first, because more production is expected to come from operating firms that have losses to carry forward and set off against future tax liabilities; and second, because more operating and capital expenditure is expected to be undertaken by firms that have sufficient profits to set it off against. New information on field ownership also affects the profile of receipts through the projection period;
- HMRC have updated the information used to model the ring fence expenditure supplement in the projections. As the supplement raises the amount of profit that can be offset with a given amount of past losses, the change interacts with the updating of field level information described above; and
- the effect of moving some losses into the future as a result of lower production in the March forecast. If production is lower in the medium term then there will be less profit against which to offset expenditure. Once this production does occur, the losses can be used up and offset against tax liabilities.
- these downward revisions are offset by around £4 billion due to lower expected expenditure, which is tax deductible. This reflects the fact we have revised down the capital expenditure projections in our medium-term forecast (which knocks through to the long term), because of updated information from operators. This is partly offset by revisions in the opposite direction for operating expenditure.

4.22 Changes in the tax position of individual companies can cause large movements in the projections, particularly the profile of losses that are available to offset 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 they collect (and so we cannot fully disaggregate the changes described above, for example). We have also smoothed the profile of receipts over the long-term projections to remove some of the year-to-year volatility that reflects the changing tax position of individual companies, as this would imply a spurious degree of accuracy in individual years of the projection.

4.23 Taken together with the medium-term forecast revisions over the past year, we have revised down projected oil and gas revenues over the period from 2013-14 to 2040-41 by £20.6 billion since last year's *FSR*.

Chart 4.4: Long-term projections of oil and gas receipts



Source: HMRC, ONS, OBR

## Scenarios

4.24 Given the large uncertainties inherent in the assumptions that underlie our medium- and long-term revenue projections, we show how sensitive these projections are to different outcomes for prices and production.

### Price scenarios

4.25 Our price scenarios utilise DECC’s price projection variants. In order to maintain consistency with our medium-term forecast, we apply the growth rate of the DECC high and low oil price scenarios to the level of prices assumed in the final year of the March forecast.

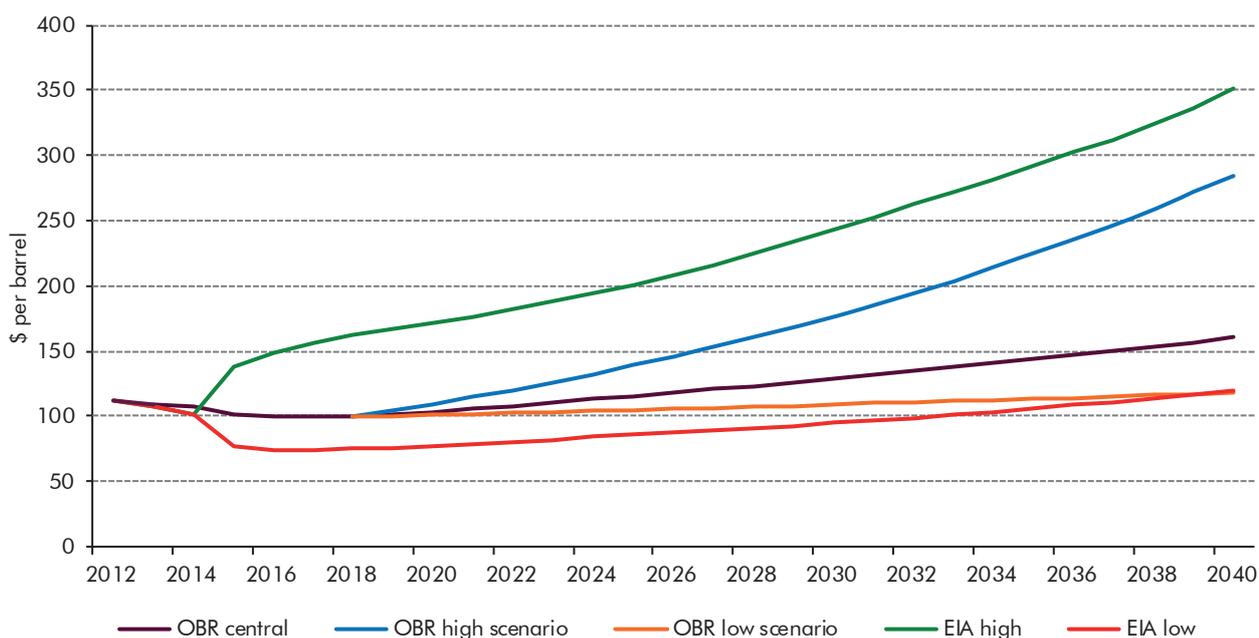
4.26 We also assume that changes in the oil price feed through to operating and capital expenditure costs. As we identified last year, unit operating and capital costs have increased on average at around half the rate of oil prices in recent years, with the sharp rise in oil prices in 2008 and 2011 associated 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 feed through into taxable profits and receipts.

4.27 In our high oil price scenario nominal dollar oil prices rise to around \$285 a barrel, around \$25 a barrel higher than in the same scenario last year. In our low oil price scenario, prices are around \$10 a barrel higher at the end of the projection period than in last year’s analysis.

4.28 In order to test our projections against an even wider range of possible oil prices, we have also produced scenarios based on the EIA’s ‘High’ and ‘Low’ price scenarios, which are projected to 2040 and include changes to the medium-term forecast period. In these

scenarios, oil prices see a step change in 2015, where prices increase by \$36 a barrel in their 'high' scenario and fall by \$25 in their 'low' scenario. Thereafter, prices move broadly in line with our alternative scenarios. In the EIA high scenario, nominal dollar oil prices reach around \$350 a barrel in 2040, nearly \$70 a barrel higher than our high price scenario. Of course, there would be wider economic effects if oil prices reached these levels, which we have not attempted to model in this analysis. The EIA low scenario has prices rising more quickly than in our low price scenario, so prices are similar by 2040 in both scenarios.

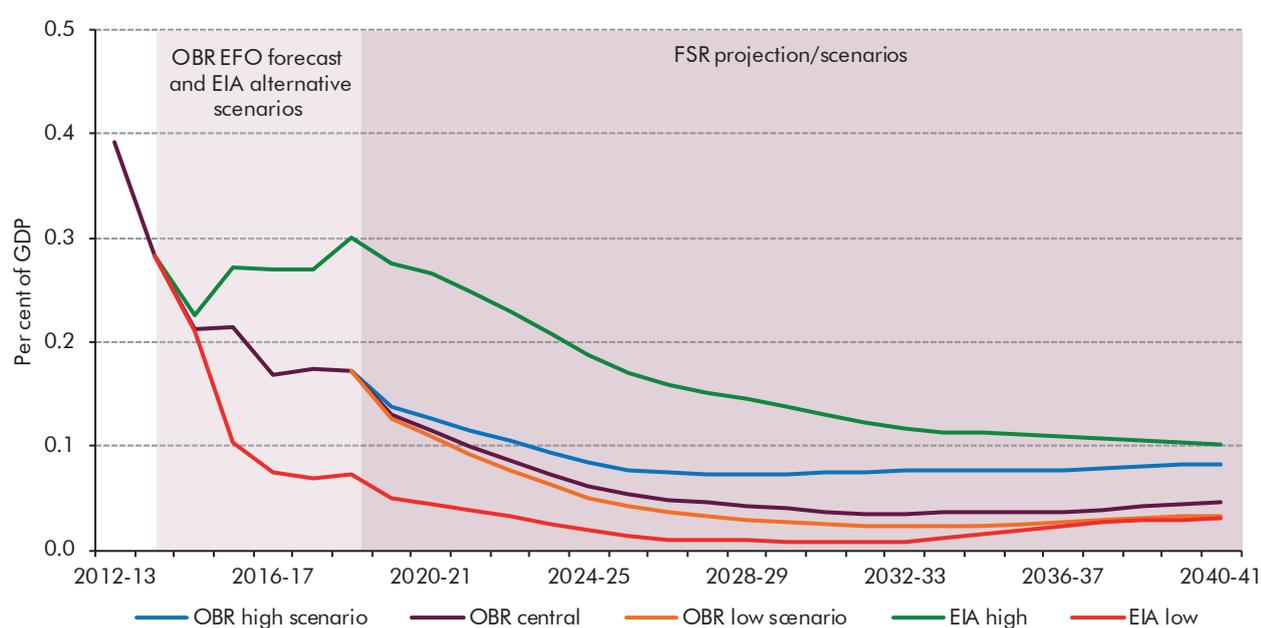
Chart 4.5: Oil price scenario assumptions



Source: OBR, EIA

- 4.29 Relative to our central projection, the 'OBR high' oil price scenario increases revenues by around 0.03 per cent of GDP on average between 2019-20 and 2040-41. Receipts total £65.3 billion over that period, £25.9 billion more than in the central projection. The 'OBR low' oil price scenario reduces revenues by around 0.01 per cent of GDP on average over the same period. Receipts total £30.5 billion, around £8.8 billion less than in the central projection.
- 4.30 Relative to our central projection, the 'EIA high' oil price scenario increases revenues by around 0.1 per cent of GDP on average between 2019-20 and 2040-41. Receipts total £111.1 billion over that period, £71.8 billion more than in the central projection. The 'EIA low' oil price scenario reduces revenues by around 0.03 per cent of GDP on average over the same period. Receipts total £16.3 billion, which is £23.0 billion less than in the central projection.

Chart 4.6: Oil and gas revenues under alternative oil price scenarios



Source: HMRC, OBR, ONS

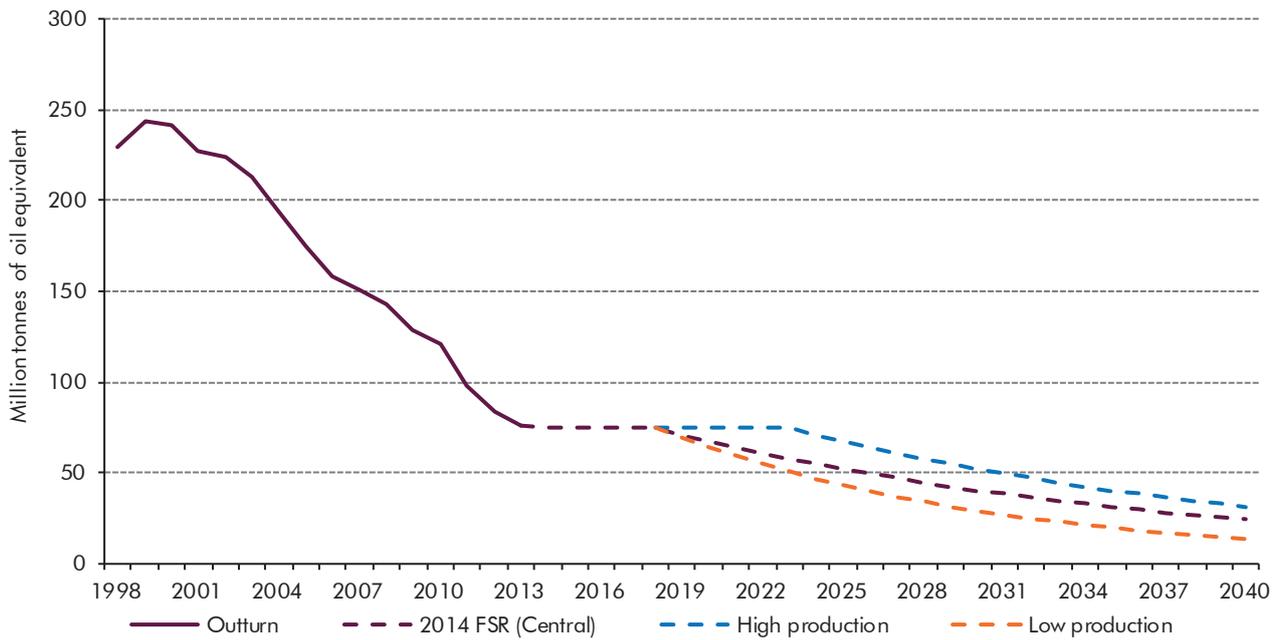
Table 4.3: Projected revenues from alternative price scenarios

	Central	Low prices	High prices	EIA high prices	EIA low prices
<b>Total receipts (2019-20 to 2040-41)</b>					
£ billion	39.3	30.5	65.3	111.1	16.3
<i>Difference from central projection</i>	-	-8.8	25.9	71.8	-23.0
<b>Total receipts (average 2019-20 to 2040-41)</b>					
Per cent of GDP	0.06	0.04	0.09	0.16	0.02
<i>Difference from central projection</i>	-	-0.01	0.03	0.10	-0.03

### Production scenarios

- 4.31 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. Over the long term, recoverable reserves are clearly on a declining path as the basin matures, resources are exhausted and become increasingly difficult or uneconomic to extract.
- 4.32 Our central long-term assumption is that production falls by 5 per cent a year from 2019 onwards. For our low production scenario we assume a 7.5 per cent a year fall – broadly in line with the average 7.8 per cent a year fall since 1999. If recent high levels of investment provide a boost to production, we may see current levels maintained over a longer period. Our high production scenario sees production remaining as we expect in 2014 for a further 10 years, with a fall of 5 per cent a year thereafter, in line with the assumption in the central projection. Over the projection period as a whole, this is equivalent to assuming production increases by around 20 per cent in the near term – broadly in line with industry expectations – and then falls by 5 per cent a year thereafter.

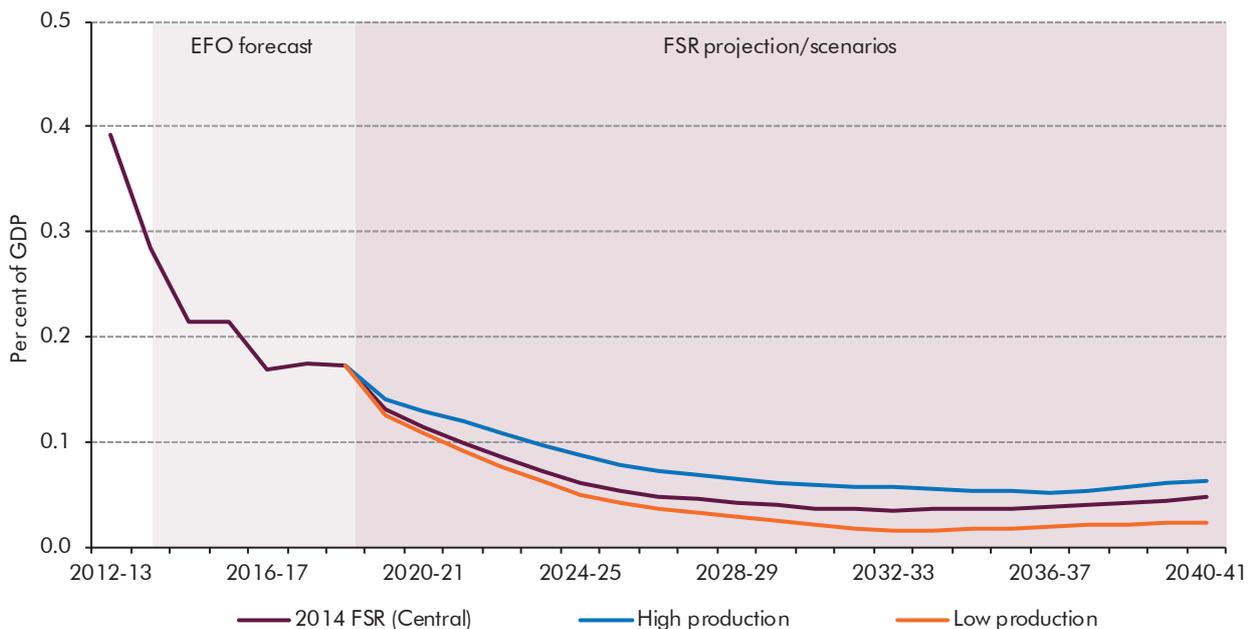
Chart 4.7: Production scenario assumptions



Source: DECC, OBR

4.33 Revenues from our high and low production scenarios average 0.07 and 0.04 per cent of GDP respectively over the 2019-20 to 2040-41 period, compared to 0.06 per cent of GDP average for the central projection. The low production scenario yields around £13 billion less than the central projection over that period, while the high production scenario yields around £15 billion more.

Chart 4.8: Oil and gas revenues in the production scenarios



Source: HMRC, OBR, ONS

Table 4.4: Projected revenues from alternative production scenarios

	Central	Low production	High production
<b>Total receipts (2019-20 to 2040-41)</b>			
£ billion	39.3	26.4	54.3
<i>Difference from central projection</i>	-	-12.9	14.9
<b>Total receipts (average 2019-20 to 2040-41)</b>			
Per cent of GDP	0.06	0.04	0.07
<i>Difference from central projection</i>	-	-0.02	0.02

## Conclusion

- 4.34 Oil and gas receipts are the most volatile revenue streams in the UK public finances and forecasting them over even very short horizons is fraught with difficulty. Our medium-term forecasts have tended to be overoptimistic in recent years, mostly because production has fallen short of expectations.
- 4.35 Over the longer term, we can be more confident that oil and gas receipts are on a declining trend as total production from the UK continental shelf moves towards its ultimately recoverable capacity. The same factors that make North Sea receipts volatile on a year-to-year basis make it very hard to predict the pace of the trend decline with any confidence. The production and price variants in this chapter give some sense of the main uncertainties. But even an assumption of oil prices reaching \$350 a barrel leaves receipts as a share of GDP in 2040-41 at less than a fifth of the average of the past 10 years. The potential exploitation of shale gas is a significant, but as yet unquantifiable, upside risk.

## Transport taxes

- 4.36 In this section we consider long-term projections for fuel duty and vehicle excise duty (VED). In particular, we look at the impact of increased fuel efficiency in conventional cars and the uptake of alternatively fuelled vehicles, such as plug-in hybrids or fully-electric vehicles.
- 4.37 Over the past few decades there has been a marked improvement in fuel efficiency, with average new car CO<sub>2</sub> emissions falling by around 27 per cent since 2000. This reflects improvements in engine technology and a move to diesel, encouraged by EU regulation and Government policy.
- 4.38 The biggest driver of the recent improvement is thought to be EU-wide regulation, which has prompted manufacturers to produce more fuel efficient cars. In essence, the improvements are thought to be supply rather than demand driven. The regulations require new cars to have average levels of CO<sub>2</sub> emissions at 130g/km in 2015 and 95g/km by 2020.<sup>11</sup> Further targets have yet to be agreed for the post-2020 period. The Government's car scrappage scheme also helped, as it encouraged new car purchases and the scrapping of older, less efficient, vehicles.

<sup>11</sup> Extra flexibility to help manufacturers meet the 2020 targets has been introduced.

- 4.39 Fuel efficiency affects fuel duty receipts via its impact on the overall consumption of fuel. Duty paid fuel consumption has been broadly flat over the past decade, with gradually rising mileage offset by increases in fuel efficiency. It affects VED because most tax rates are graduated by fuel efficiency.

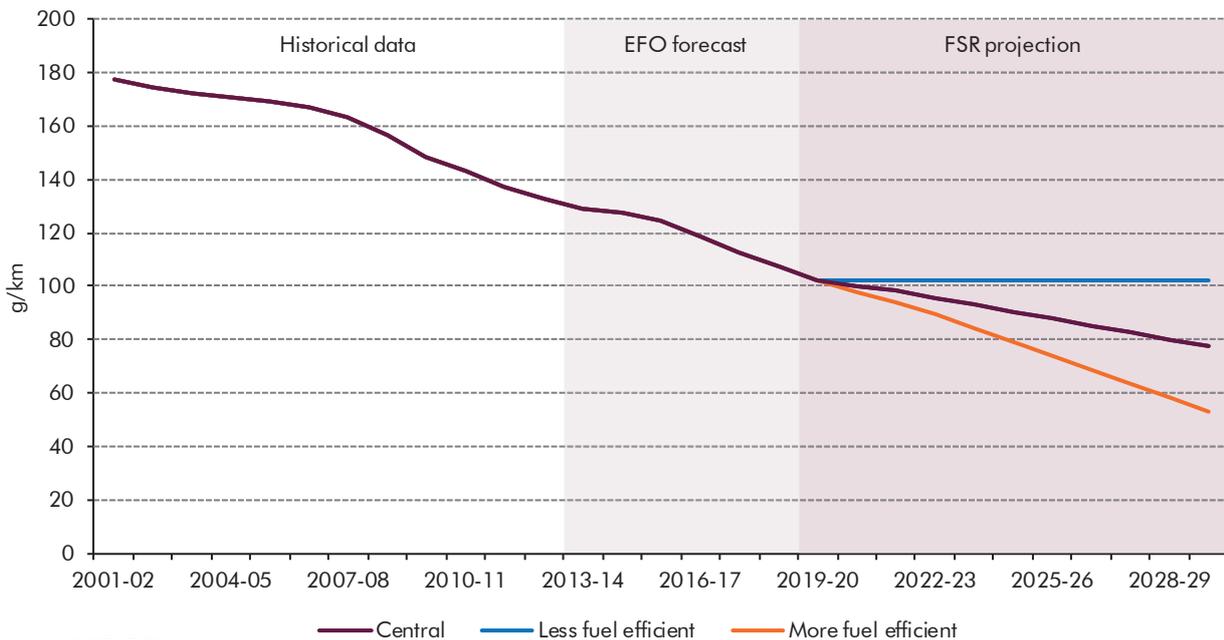
### Scenarios for future fuel efficiency improvements

- 4.40 We consider three different fuel efficiency scenarios for new cars in the following analysis. All three assume that manufacturers in the UK meet the 2015 target of 130g/km and only comply with the 95g/km in 2020 when the extra flexibility recently introduced by the EU is taken into account.<sup>12</sup> Their paths deviate from 2020 onwards:
- the 'Less fuel efficient' scenario assumes that improvements in new car fuel efficiency to 2020 are entirely supply driven, i.e. manufacturers are only producing and selling more efficient cars because of the binding EU regulation. In the absence of regulation beyond 2020, there is assumed to be no incentive for new car fuel efficiency to improve. As such, only scrappage will lead to improvements in fleet fuel efficiency over the projection period. This scenario is consistent with the Department for Transport's assumptions in its road transport forecasts;
  - our 'Central' scenario assumes that new car fuel efficiency will improve over the projection period in line with recent trends. In this scenario, average new car fuel efficiency reaches 78g/km in 2029-30; and
  - the 'More fuel efficient' scenario is consistent with the recommendation of the Committee on Climate Change (CCC) that new car efficiency needs to reach 50g/km by 2030 and trend towards zero emissions by 2035. The recommendation by the CCC is consistent with the Government's long-term ambition of reducing carbon emissions by 80 per cent (relative to 1990) by 2050, which includes zero emissions (at the tailpipe) by road transport. This scenario uses the same end-point as the central projection in *FSR 2011*. But while the targets remain the same, the path has changed considerably due to fuel efficiencies improving faster than expected in the short term.

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<sup>12</sup> European Parliament (2014)

Chart 4.9: Fuel efficiency scenarios



Source: DFT, OBR

4.41 Meeting the targets in the ‘more efficient’ scenario assumes new car efficiency gains of 35 per cent over the next 10 years and a further 60 per cent in the following decade, compared with the 25 per cent efficiency gains of the past decade. These figures could only be met if there was a significant increase in the market penetration of alternatively fuelled ultra-low emission vehicles (ULEVs). The CCC assume that its 2030 target will require 60 per cent of new cars to be plug-in hybrids or fully electric. The CCC analysis showed that “achieving a high uptake of EVs by 2030 is possible given a good supply of models, and a package of measures to address current financial and non-financial barriers. These could include battery leasing to reduce purchase price premiums, a modest national rapid charging network to complement overnight home/depot-based charging, marketing to improve consumer awareness and acceptance, and provision of financial and/or non-financial ‘cost-equivalent’ support.”<sup>13</sup>

4.42 In recent years, ULEVs have seen rapid growth, but still only represent a very small percentage of all vehicle sales and even smaller proportion of the overall fleet. In the first quarter of 2014, while ULEVs made up 0.2 per cent of new vehicle registrations they constituted only 0.05 per cent of the total stock of vehicles.<sup>14</sup> In order to reach the levels that the CCC targets imply, significant improvements to infrastructure would be required.

### Fuel duty

4.43 Fuel duty is charged on a pence per litre basis, so will be affected by the duty rate and the demand for fuel. In our latest *EFO*, we forecast fuel duty receipts to fall from 1.6 per cent of GDP in 2013-14 to 1.5 per cent of GDP by 2018-19 reflecting improvements in fuel

<sup>13</sup> Committee on Climate Change (2013)

<sup>14</sup> Data taken from DfT and the DVLA.

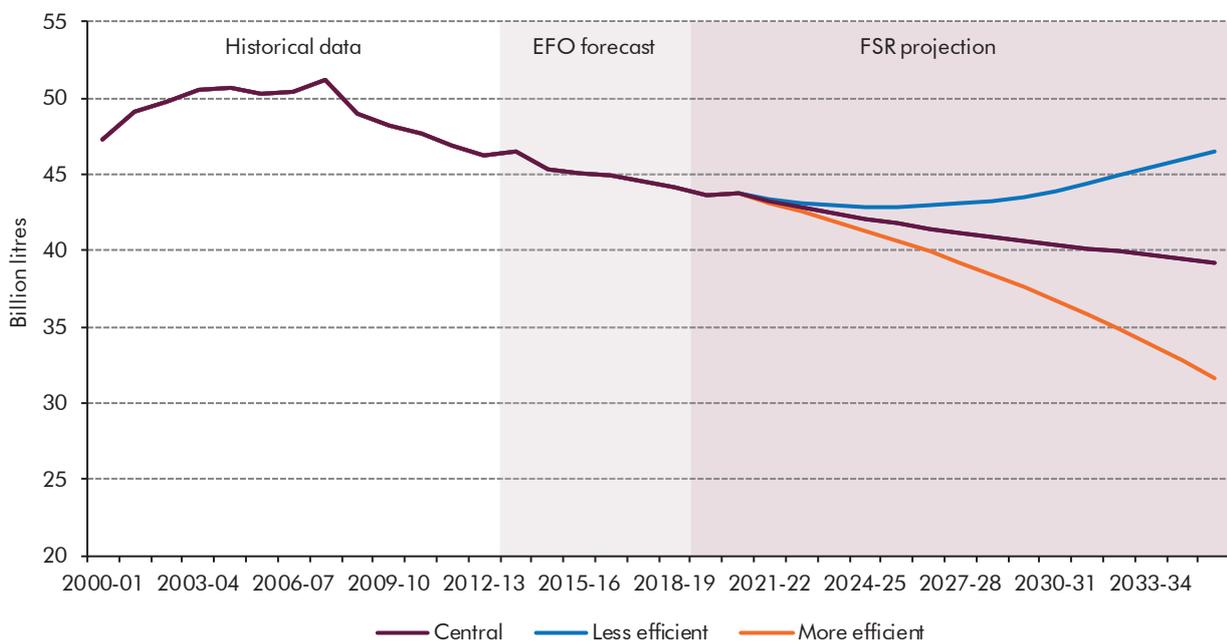
## The sustainability of tax revenues

efficiency and fuel duty rates being revalorised by RPI from September 2015. In this section we show projections of fuel duty revenues to 2033-34 based on the following assumptions:

- the projection out to 2018-19 is in line with our March 2014 *EFO* forecast;
- revalorisation of fuel duty each year in line with RPI inflation (assumed to be 3.3 per cent a year in the long run);
- three scenarios for the path of new car fuel efficiency (described above); and
- oil prices rising by around 2.2 per cent a year in cash terms, as in our projection of North Sea revenues.

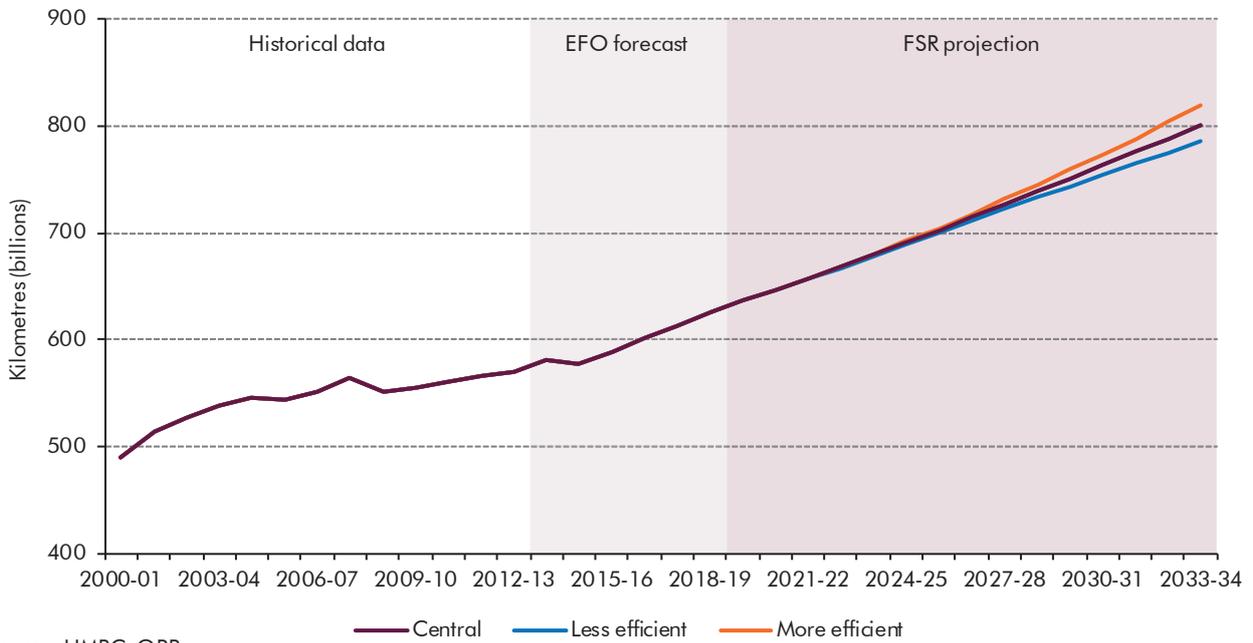
4.44 On the basis of these assumptions, Chart 4.10 shows how sensitive the demand for fuel is to the different fuel efficiency scenarios. Low fuel efficiency would keep the demand for fuel rising throughout the projection period. Our central and high efficiency scenarios result in demand falling at different rates. This is despite mileage rising in all three scenarios, as shown in Chart 4.11.

Chart 4.10: Fuel consumption under alternative scenarios



Source: HMRC, OBR

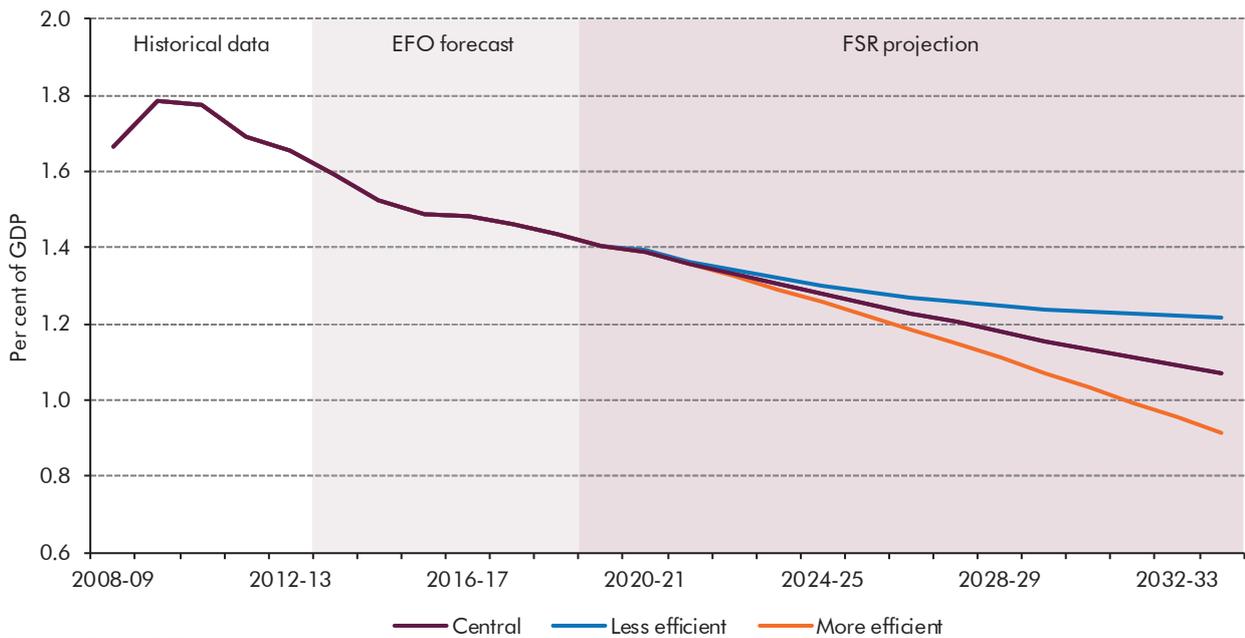
Chart 4.11: Mileage scenarios



Source: HMRC, OBR

4.45 Chart 4.12 shows the outlook for fuel duty receipts under each scenario and it illustrates the significant impact that these assumptions have. Our central projection implies a 0.5 per cent of GDP fall in receipts between 2014-15 and 2033-34. Under the low efficiency scenario, revenues fall slightly less, by 0.4 per cent of GDP. But if the CCC targets were met, we would expect a 0.7 per cent of GDP reduction to less than 1 per cent of GDP.

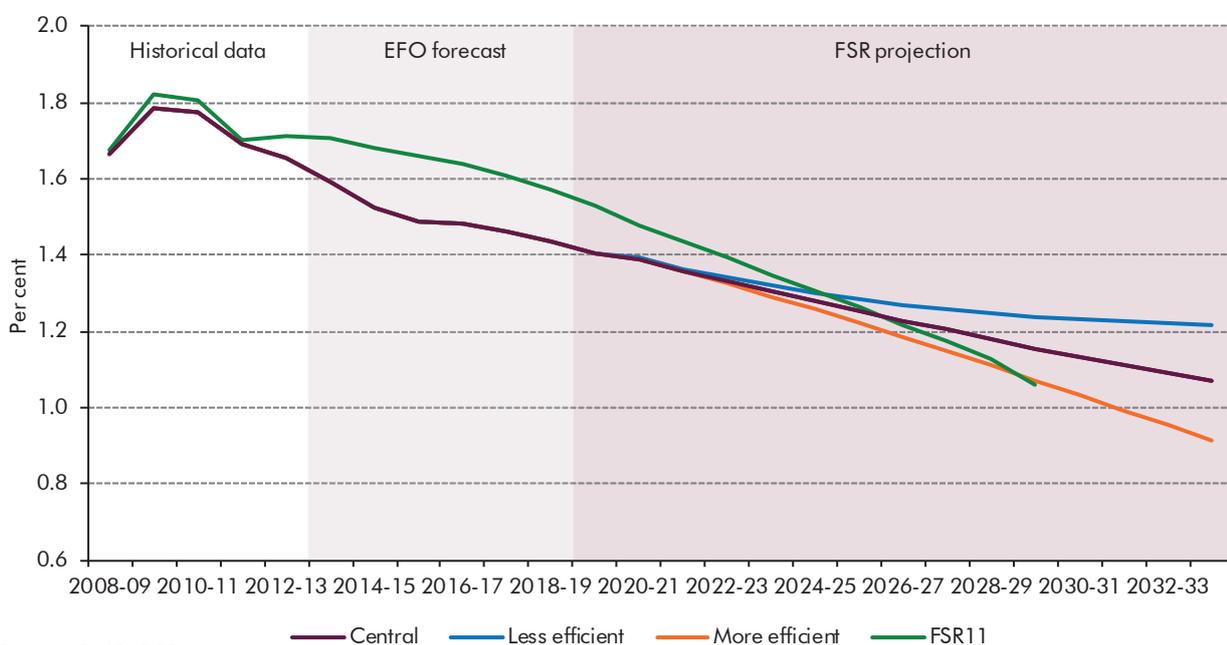
Chart 4.12: Fuel duty projections



Source: ONS, OBR

4.46 Chart 4.13 compares the fuel duty projection from *FSR 2011* – the last time we looked at this issue in detail – to the scenarios (the more efficient scenario gives more of a like-for-like comparison) in this report. Receipts are 0.07 per cent of GDP lower on average in the more efficient scenario than in the 2011 projection. This reflects: that fuel efficiency has improved more rapidly than was anticipated in 2011; and that the Government has cancelled successive fuel duty increases (as well as making a 1p reduction in April 2011), so duty rates are significantly lower than was projected then. Our current central projections assume slower fuel efficiency gains than the *FSR 2011* projections. This results in the current projections ending at a higher level than in *FSR 2011*, despite starting from a lower level.

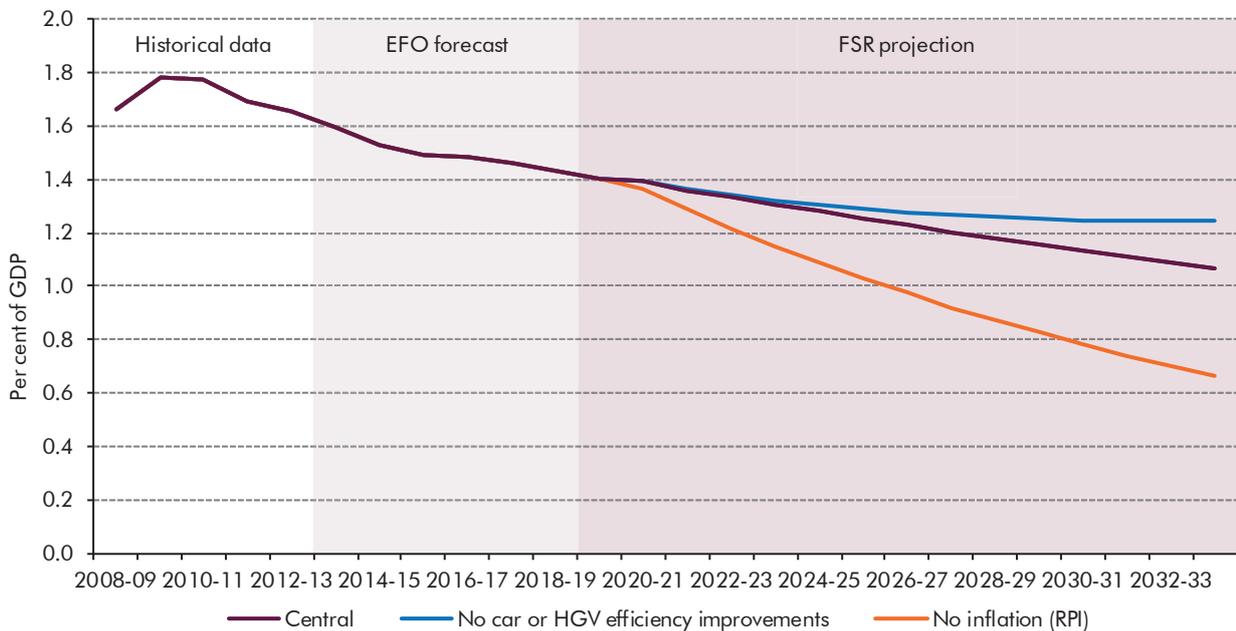
Chart 4.13: Fuel duty revenues – comparison with *FSR 2011*



Source: ONS, OBR

4.47 Chart 4.14 shows the projected path of receipts under stylised assumptions of no fuel efficiency gains and no annual RPI revalorisation respectively. This highlights the importance of each factor in the final projections. Failing to revalorize with RPI – instead freezing fuel duty rates in cash terms from the end of the medium-term forecast period – would cause a sharper reduction in fuel duty receipts than the high fuel efficiency scenario, with them falling to 0.7 per cent of GDP by the end of the projection period.

Chart 4.14: Revalorisation and efficiency effects on fuel duty projections



Source: ONS, OBR

4.48 Since *FSR 2011*, there have also been policy announcements aimed at incentivising the use of biofuels and other alternative fuels in the HGV sector. Support for cleaner fuels announced at Autumn Statement 2013 aimed to incentivise the adoption of cleaner fuels by the HGV industry by fixing the duty differential for 10 years. The impact of this costing was assumed to rise over time beyond the original scorecard period. While the analysis presented here implicitly assumes relatively little demand for these products, there is a risk that demand could start to rise rapidly and further reduce fuel duty receipts. This is important as the assumptions underpinning these projections mean that the proportion of fuel duty due to HGVs would rise from 25 per cent in 2013-14 to over 45 per cent in 2033-34 because the fuel efficiency of cars is assumed to improve more rapidly than HGVs. This would be a continuation of recent trends. If fuel duty from HGVs was to fall by the same proportion as fuel duty from cars, a further 0.1 per cent of GDP of receipts in 2033-34 would be lost.

### Vehicle excise duty

4.49 VED is applied in 13 graduated bands depending on the level of carbon emissions, with more polluting cars taxed more heavily. (VED bands for cars built before 2001 and other vehicles are not linked to emission levels.) In April 2010, first-year rates were introduced with the stated aim of sending an additional signal to the buyer about the environmental impact at the point of purchase. Vehicles with fuel efficiency of up to 100g of CO<sub>2</sub>/km are exempt from VED, while vehicles up to 130g/km are exempt from the first-year rate.

4.50 Since 2008-09, VED receipts have risen only 9 per cent in cash terms. Our March medium-term forecast has receipts falling in both nominal terms and as a per cent of GDP from 2014-15 onwards. This is driven by gains in fuel efficiency and the VED reduction for HGVs

## The sustainability of tax revenues

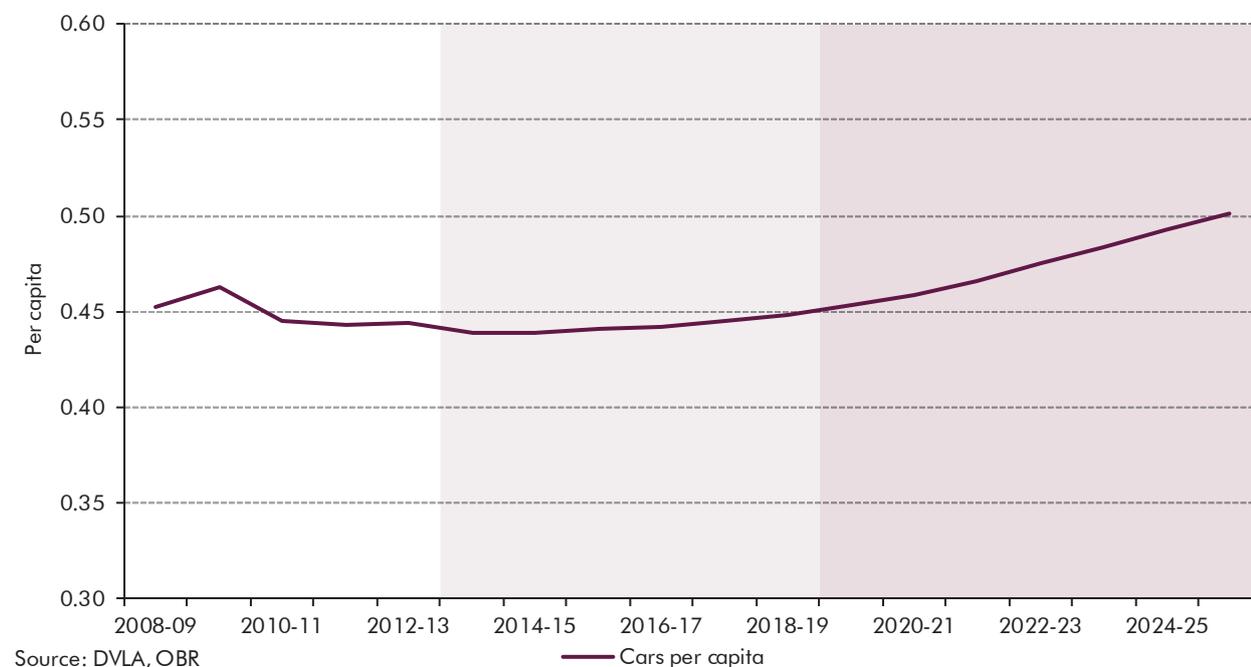
due to the implementation of the road lorry user charge in 2014-15. Receipts are forecast to fall from 0.37 per cent of GDP in 2013-14 to 0.27 per cent in 2018-19.

**4.51** Our projection for VED revenues to 2033-34 is produced by projecting the stock of vehicles in each VED band multiplied by the appropriate duty rates, assuming the following:

- the projection to 2018-19 is in line with our March 2014 *EFO* forecast;
- unchanged emission bands, with VED rates for each band uprated in line with RPI inflation each year;
- three scenarios for the path of new car fuel efficiency (described above); and
- the stock of cars evolves in line with expected scrappage rates and a projection for new sales linked to GDP growth.

**4.52** The assumptions mean that the total number of cars rises in every year of the projection. Cars per capita rise from 0.44 in 2013-14 to 0.50 in 2025-26.<sup>15</sup> This is worth bearing in mind when considering the downward trajectory of the VED projections, which reflect less VED paid per car, not fewer cars. If the relationship between economic growth and new car sales did not hold over the long term then this could have an impact on the VED projections.

**Chart 4.15: Cars per capita**

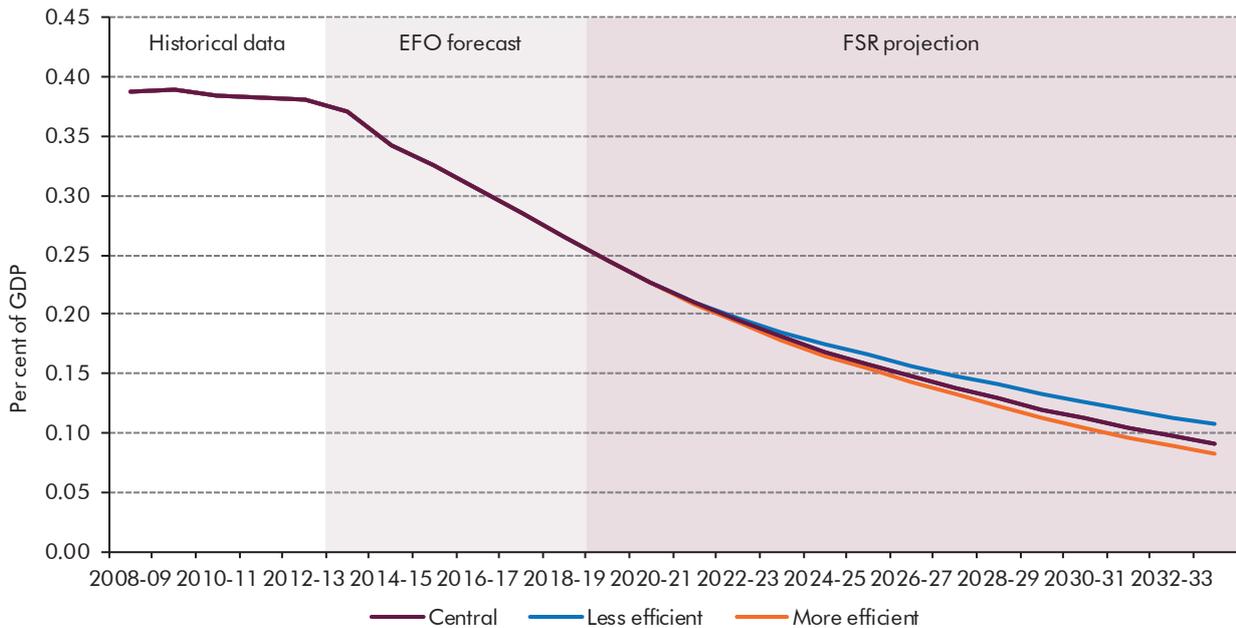


**4.53** Our long-term projections suggest that the expected decline in VED receipts over the medium-term forecast will continue over the projection period. On the basis of current policy and the central fuel efficiency assumption, VED receipts are projected to fall from

<sup>15</sup> Data taken from DVLA and ONS for Great Britain.

0.27 per cent of GDP in 2018-19 to 0.09 per cent of GDP in 2033-34. As old cars are replaced by more efficient new cars, more of the vehicle stock moves into lower emission bands each year. Chart 4.16 shows that the projections are not particularly sensitive to different fuel efficiency assumptions, because such a large proportion of the vehicle stock is already forecast to be in the lowest VED bands by the end of the medium-term forecast.

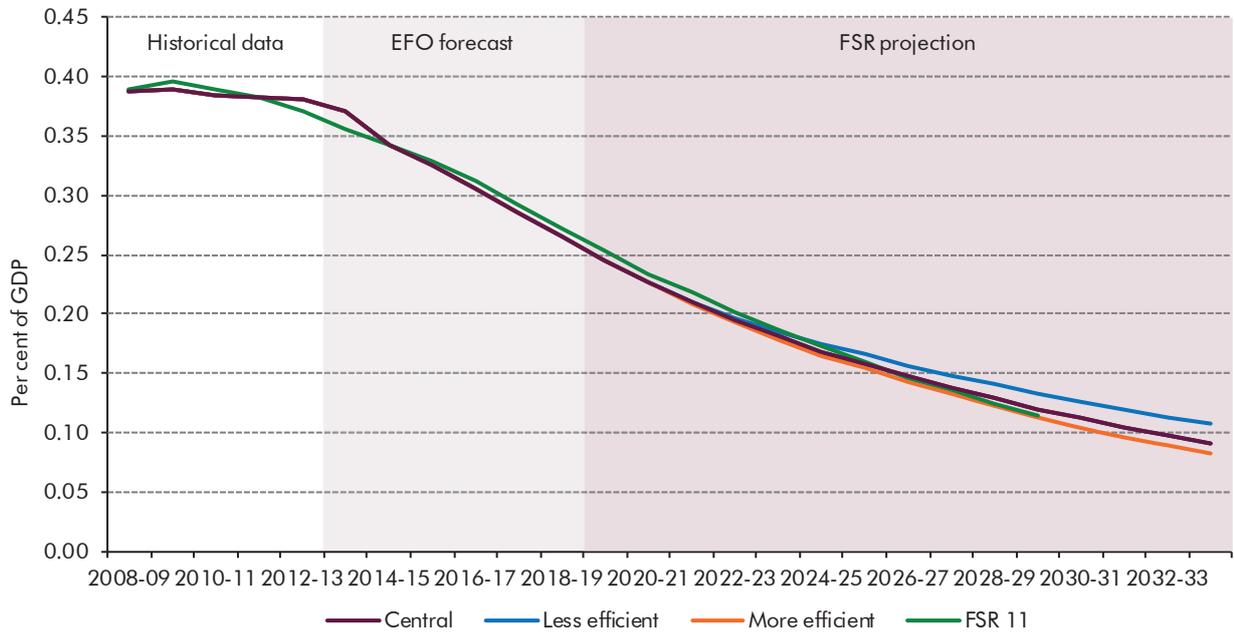
Chart 4.16: Vehicle excise duty projections



Source: ONS, OBR

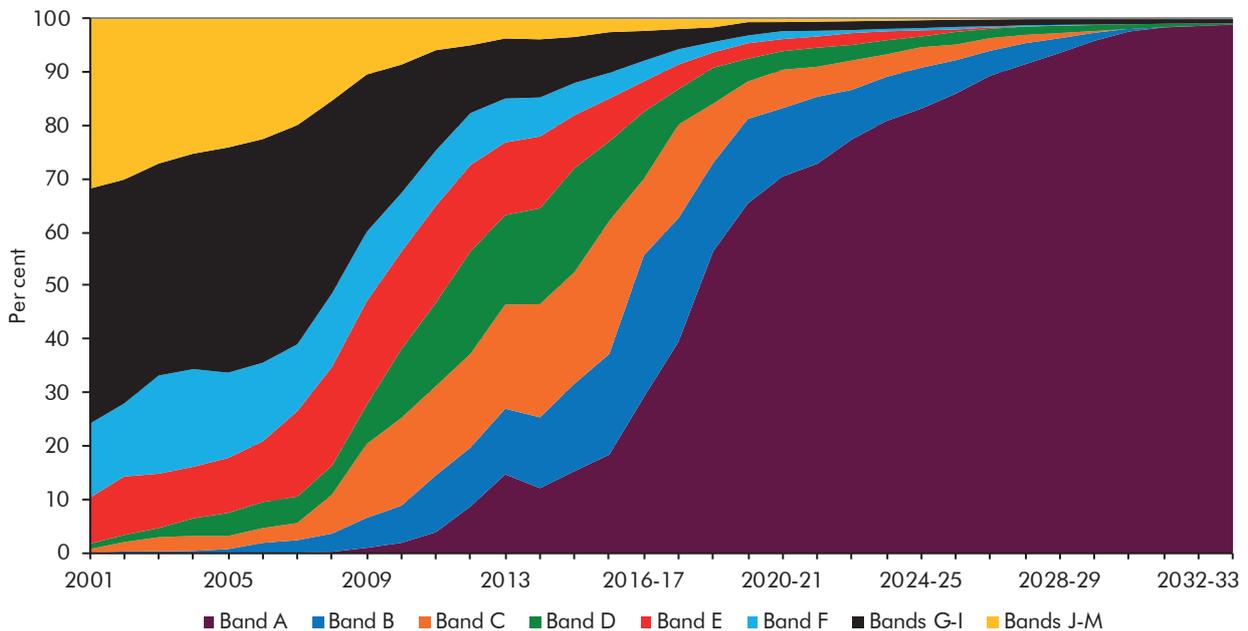
4.54 Chart 4.17 shows the difference in the VED projection between the current projections and the path assumed in *FSR 2011*. This highlights the fact that despite the use of different assumptions around fuel efficiency improvements, the revenue forecast has not changed significantly. This is because cars with emissions below 100g/km do not pay VED, so once the average falls below this level revenue becomes less sensitive to further improvements. Chart 4.18 illustrates the proportion of cars in different VED bands across the projection period. If these trends continued beyond the projection period, we would expect VED receipts to eventually fall towards zero. Any remaining receipts would come from cars built before 2001 and other vehicles such as motorcycles and HGVs.

Chart 4.17: Vehicle excise duty revenues - comparison with FSR 2011



Source: ONS, OBR

Chart 4.18: Distribution of VED bands for projected stock of vehicles



Source: DVLA, OBR

4.55 One risk in these VED projections is that efficiency improvements may not be even across all emission levels. If the improvements took a bimodal distribution, there could be a mix of less fuel efficient ‘gas guzzlers’ and more fuel efficient ULEVs. This would result in higher receipts than the projections imply. If we assume that the number of cars in bands K, L, M remains constant at 4 per cent from 2019-20 onwards this would add a further 0.06 per cent of GDP to receipts in 2033-34. There has been no evidence of this to date.

# 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 size of the gap between the real 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. If the interest rate paid on government debt remains below the rate of growth, then net

## Summary indicators of fiscal sustainability

debt would still fall as a share of GDP even if the government were to run a primary budget deficit.

- 5.6 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 4.6 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 2063-64.
- 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 2019-20. On this basis, the UK's inter-temporal budget gap is currently equal to 1.7 per cent of GDP. In other words, under our central projections the government would need to increase taxes and/or cut spending permanently by 1.7 per cent of GDP (around £28 billion in today's terms) from 2019-20 onwards to satisfy the inter-temporal budget constraint with an immediate and permanent adjustment. The equivalent figure for the UK's inter-temporal budget gap in last year's *FSR* was 1.9 per cent of GDP. Not coincidentally, these figures are very close to, but fractionally bigger than, the scale of 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 rate of growth, 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 real interest rate and the long-term economic growth rate. We therefore show the gaps not only for our central assumption that the long-run real interest rate exceeds the economic growth rate by 0.4 percentage points, but also under alternative assumptions where the interest rate is 1 percentage point higher or lower relative to the long-term economic growth rate.

Table 5.1: Fiscal gap estimates

Target year	Adjustment in primary balance, per cent of GDP			
	2063-64	2063-64	2063-64	2053-54
Target debt to GDP ratio (per cent)	20	40	60	40
Central projection	1.3	0.9	0.5	0.7
Interest rate 1 percentage point higher	1.4	1.0	0.6	0.8
Interest rate 1 percentage point lower	1.3	0.8	0.3	0.6
Gradual progress <sup>1</sup>	0.5	0.3	0.2	0.3
Old age structure	1.1	0.7	0.2	0.3
Young age structure	0.4	0.0	-0.5	0.1
High migration	0.5	0.0	-0.4	0.0
Long-term balanced	1.7	1.3	0.9	0.9
High tens of thousands	1.5	1.0	0.6	0.8
Higher initial health & education spending <sup>2</sup>	1.6	1.2	0.8	1.0
Lower health productivity growth <sup>3</sup>	3.9	3.5	3.1	2.6

<sup>1</sup>Adjustment required each decade.

<sup>2</sup> Assuming health and education spending in 2018-19 are determined by demographics, and that other spending is reduced sufficiently to meet the Government's total spending assumption for that year.

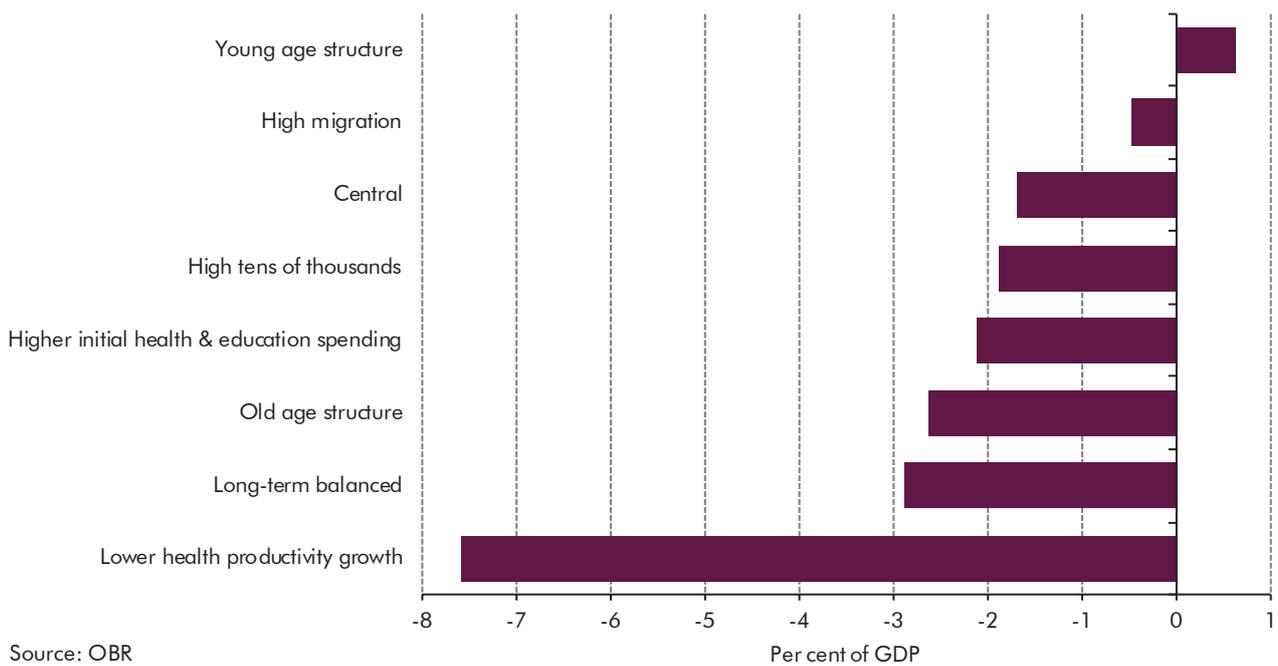
<sup>3</sup> Real health spending per capita growth of 3.4 per cent a year, equivalent to annual productivity in the health care sector of 1 per cent.

- 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 2063-64 would require a permanent increase in taxes and/or cut in spending of 0.9 per cent of GDP (£15 billion in today's terms) in 2019-20 or a series of tax increases or spending cuts worth an additional 0.3 per cent of GDP (£6 billion) each decade. These fiscal gap estimates are slightly lower than in last year's report, reflecting the slightly smaller primary deficit and lower net debt 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 2018-19, which improves the primary balance by 10.1 per cent of GDP between the peak deficit in 2009-10 and 2018-19. 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 3.4 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 3.5 per cent of GDP from 2019-20, or 1.3 per cent of GDP each decade.

5.18 Table 5.1 also shows what would be required to bring the debt to GDP ratio down to 40 per cent ten years earlier, in 2053-54. 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. As discussed in Chapter 3, the fiscal position would be less sustainable (debt would be rising more quickly) under this variant than our central projection, but the debt to GDP ratio in 50 years, and hence the implied fiscal gap, would be lower. 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 2063-64



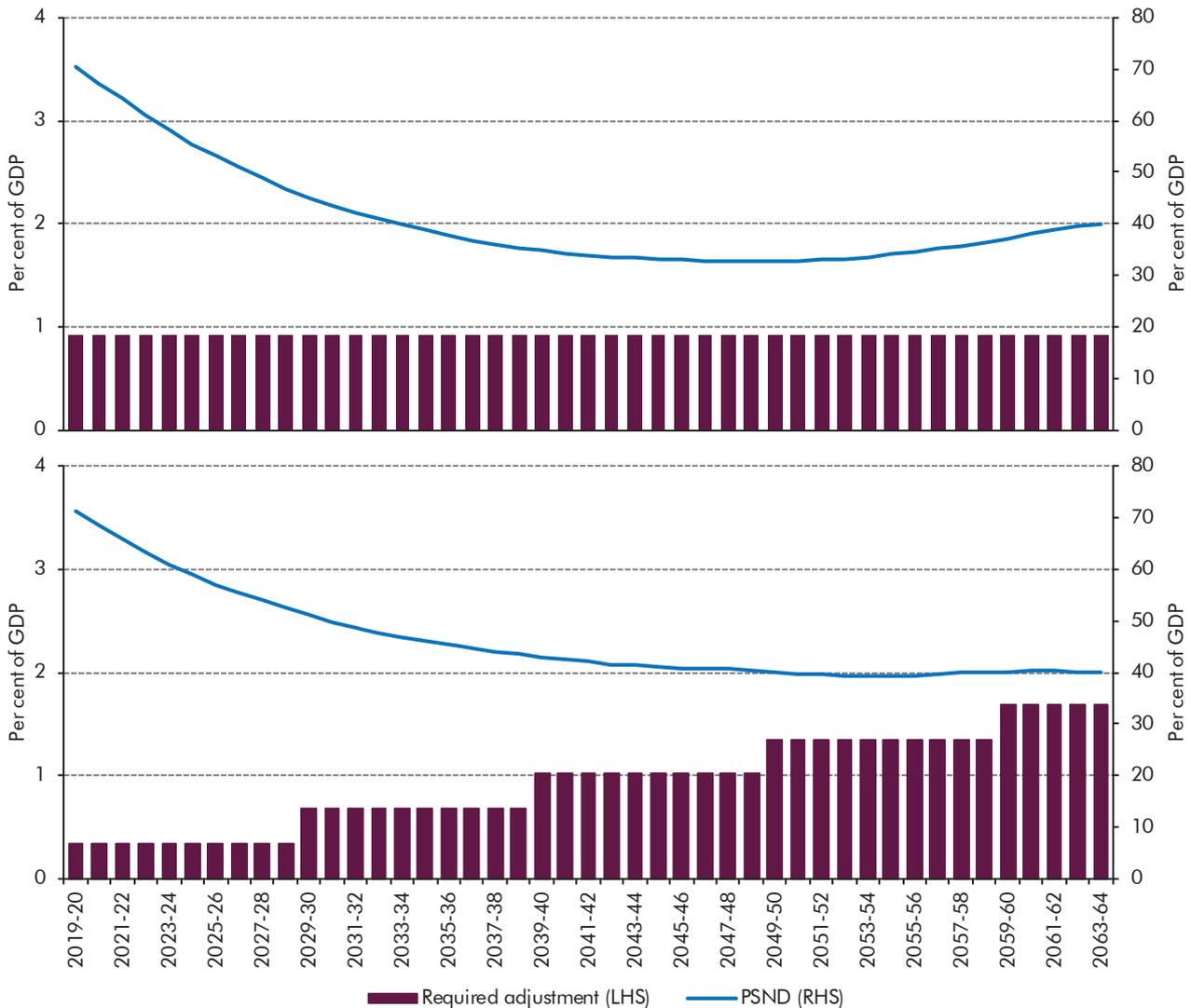
5.20 Chart 5.2 illustrates the difference that the choice between a one-off permanent adjustment and (an initially smaller, but ultimately larger) cumulative decade-by-decade adjustment makes to the path of net debt en route to the target date. It shows that:

- a once-and-for-all policy tightening of 0.9 per cent of GDP in 2019-20 would see the debt ratio fall through 40 per cent of GDP in the mid-2030s, reach a trough of 33 per cent of GDP in the 2040s and then rise back to 40 per cent of GDP in 2063-64. But the tightening would be smaller than the 1.7 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

Summary indicators of fiscal sustainability

- tightening policy by 0.3 per cent of GDP a decade would see the debt ratio fall more slowly to begin with, reaching 40 per cent in the late 2040s and stabilising thereafter. By the target date, the cumulative tightening since 2019-20 would have reached 1.7 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 several 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 the same would also be true of most advanced economies, as 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. The Government has not set a long-term target for the debt to GDP ratio and indeed 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.

# A Labour market trends

## Introduction

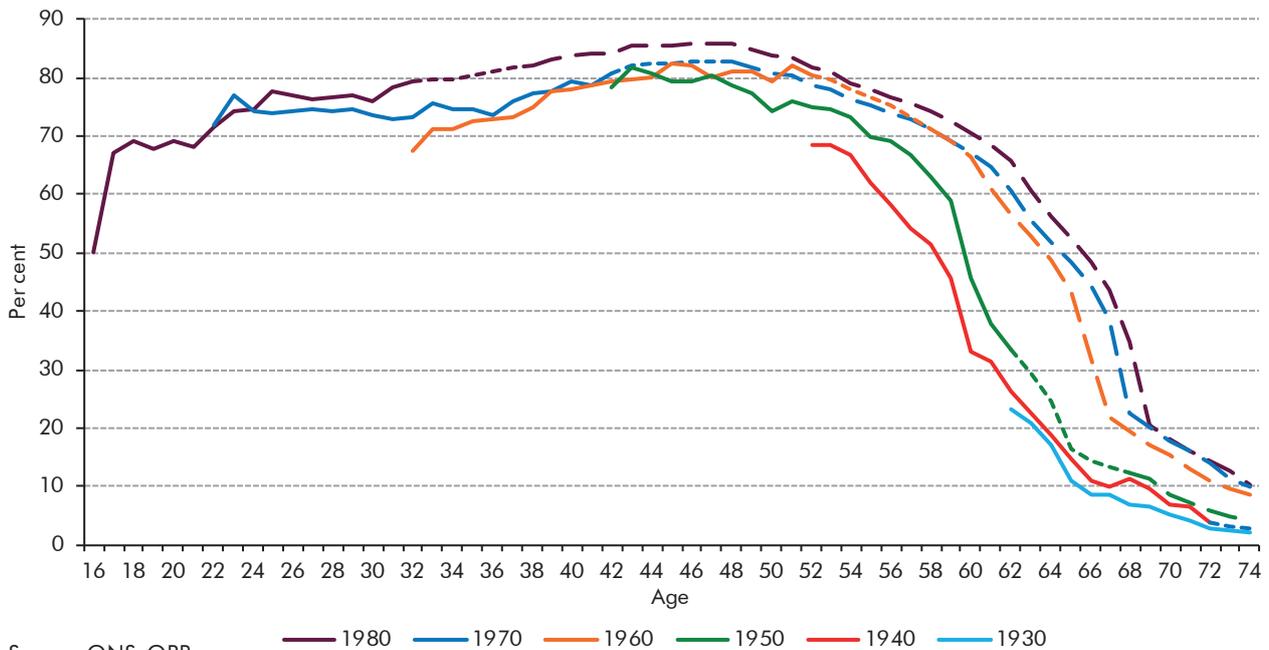
- A.1 The performance of the labour market will be crucial in shaping the long-term prospects for the public finances. Labour income represents by far the largest tax base, and it is more heavily taxed than profits. Entitlement to much of welfare spending is also linked to people's incomes, and many benefits are correlated with peoples' labour market status.
- A.2 Broadly speaking, we project a relative decline in the share of people in employment over the coming decades, which together with age-related spending pressures ultimately puts the public finances on an unsustainable trajectory. But, needless to say, there is considerable uncertainty around the projections.
- A.3 We begin this annex by summarising how we produce our long-term labour market projections and map these across to fiscal outcomes. We then turn to past trends in employment, highlighting particular features that may go on to affect the future outlook, before briefly assessing some of the uncertainties around future average earnings.

## Central projections

- A.4 Our labour market participation projections are based on historic profiles of different cohorts of the overall population – subsets that are grouped by year of birth and gender. This allows us to capture dynamics that are specific to particular ages and those that cut across generations. In essence, we project each cohort into the future using age-specific labour market entry and exit rates as they age across time. These exit and entry rates are generally held constant, although we adjust entry rates for younger cohorts (discussed further below), and exit rates for people approaching the State Pension age (SPA), since the SPA rises over our projection period.
- A.5 Although most individuals will choose to exit the labour market either before or after they reach the SPA, exit rates do spike around that point. In order to capture this effect, we shift exit rates along 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. We smooth this transmission over earlier periods, as individuals would be expected to adapt their labour market participation choices over a longer period.
- A.6 Chart A.1 shows our projections for female participation rates, by year of birth: the solid lines reflect outturns; the small dashes are illustrative rates over the medium-term forecast period, where our participation forecast is produced top-down rather than by age and gender; and the longer dashes show our long-term projections. It illustrates that we project

participation rates for women reaching old age in the future to be higher than for earlier cohorts, principally related to SPA changes, but also due to cohort effects. We project that women born in the 1980s will have higher participation rates than women born in the 1970s across all comparable ages.

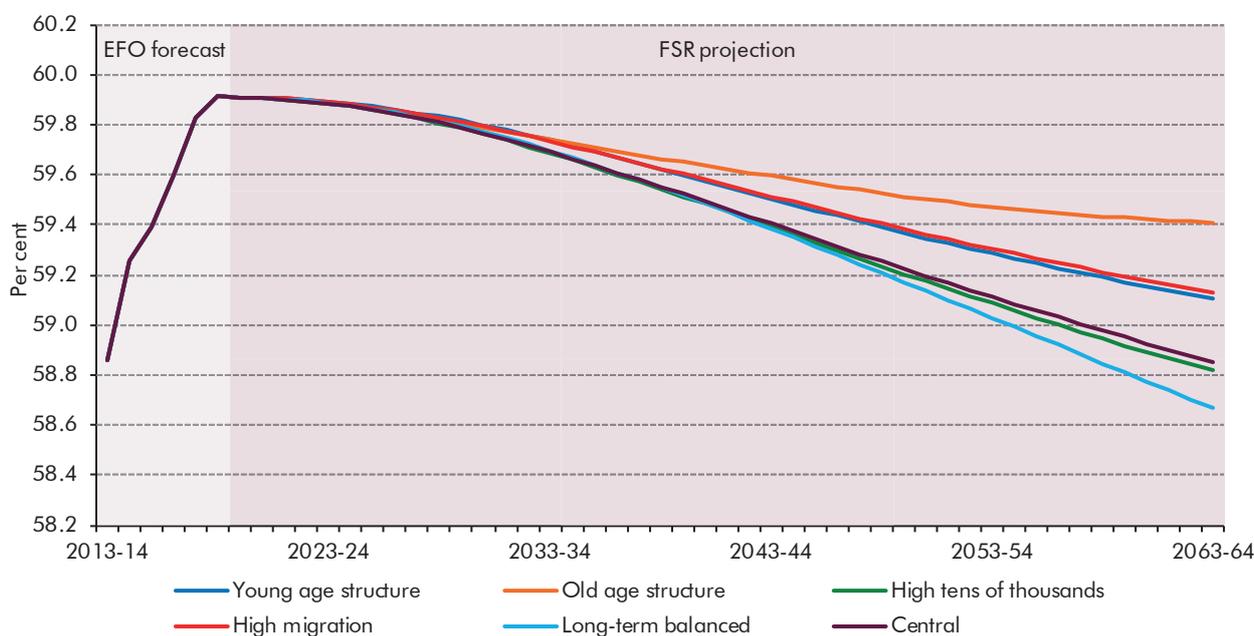
Chart A.1: Female participation rates by cohort



Source: ONS, OBR

A.7 These participation rates are then combined with demographic projections, and our assumption that the total unemployment rate remains constant in the long term, to produce future employment projections, such as those shown in Chart A.2. The total employment rate is projected to trend lower over time, as the proportion of older people in retirement increases, with the degree to which this occurs depending on the population structure and the future path of the SPA.

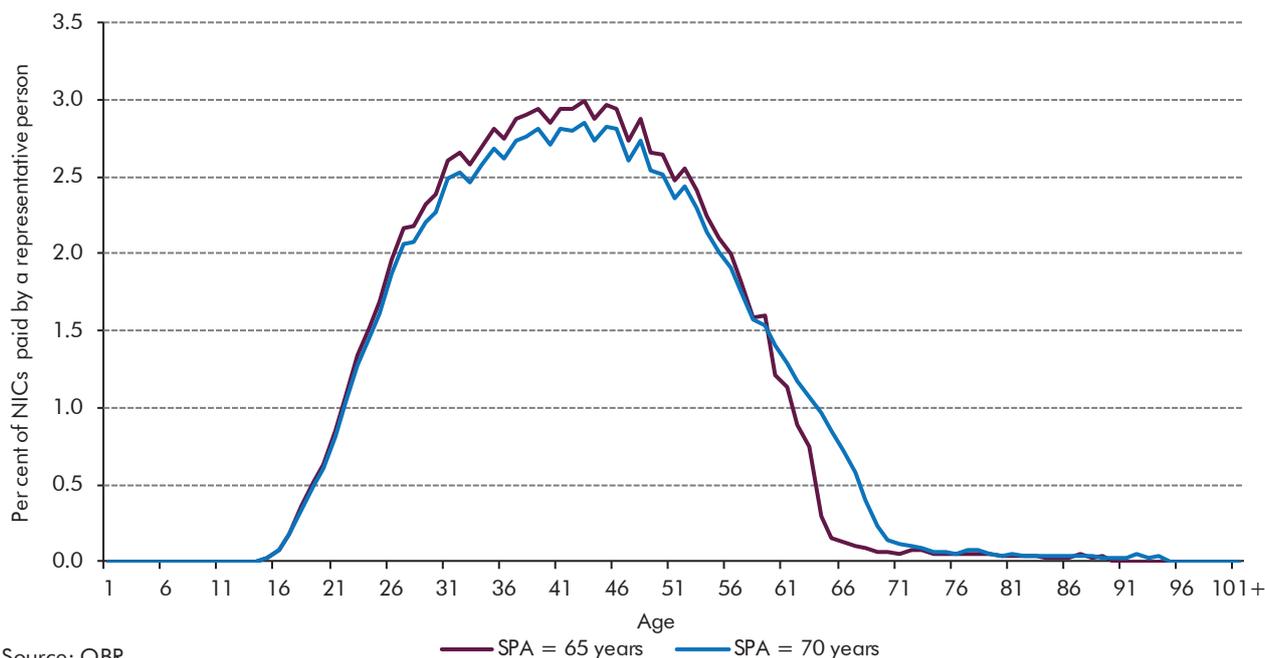
Chart A.2: Employment rate projections (16+ population)



Source: OBR

- A.8** We assume that productivity per worker will grow by 2.2 per cent a year in the long-term. This is in line with growth in average productivity per hour between 1971 and 2008. Implicitly, we are assuming that average hours do not continue trending downwards beyond the end of the medium-term forecast period. There may well be compositional effects on productivity and, more likely, average hours from an ageing population, but these are not explicitly captured in our long-term economic projections.
- A.9** Our receipts projections are produced in a similar spirit, capturing the demographic dimension of the tax base, and anticipating future SPA changes, but not explicitly modelling other non-demographic factors that might affect particular revenue streams over the long run. These projections are produced using individual receipts profiles for males and females, which capture the age distribution of receipts over a representative individual's lifetime, such as those for male National Insurance contributions (NICs) receipts illustrated in Chart A.3.

Chart A.3: Representative profiles for male NICs receipts, for a given SPA



Source: OBR

- A.10 This chart shows that NICs start to be paid as people reach working age, increasing as they move through their careers. Receipts then begin to fall after age 50 as some people take early retirement or work less hours, and fall to a very low level once they reach the SPA. Employee NIC is not paid beyond the SPA, while employer NIC is paid at all ages. We adjust the profile for SPA changes, to maintain consistency with our employment projections. Extending working lives implies that more NICs will be paid over a representative individual’s lifetime and that a greater proportion will be paid in older age, when the effective rate paid will probably be lower.
  
- A.11 We assume that tax thresholds increase with average earnings in the long term, so that – in the absence of changes in demographics or age-specific employment rates – receipts will be constant as a share of GDP. Under the latest population projections, demographic trends will not greatly affect the receipts-to-GDP ratio, which remains broadly flat throughout the projection period. Given the progressive nature of the tax system, the distribution of incomes, which we assume remains constant within specific ages, also matters.
  
- A.12 Our working age benefits projections (produced by DWP) are underpinned by similar assumptions, and so largely reflect demographic and SPA changes. We assume these benefits are uprated with earnings in the long term and that the income distribution is static, implying that they also remain roughly flat as a share of GDP.
  
- A.13 Our projections for non-benefit spending for a person of given age and gender rise in line with average earnings. This approach allows us to isolate the impact of changes in the population structure over time. Implicitly, we are assuming that being in employment does not affect demand for public services, so an increase in employment would raise receipts, but not spending, improving the long-term fiscal position.

## Employment

### Past trends

A.14 Charts A.4 and A.5 show employment rates for 25 to 75-year old men and women over the past 40 years. These are supplemented by Tables A.1 and A.2, which set out for different genders and age groups the proportion of people aged 16+ that were employed, unemployed<sup>1</sup> or inactive – by underlying factors – in the final quarter of 2013.

A.15 The broad pictures that we draw in the following sections are that:

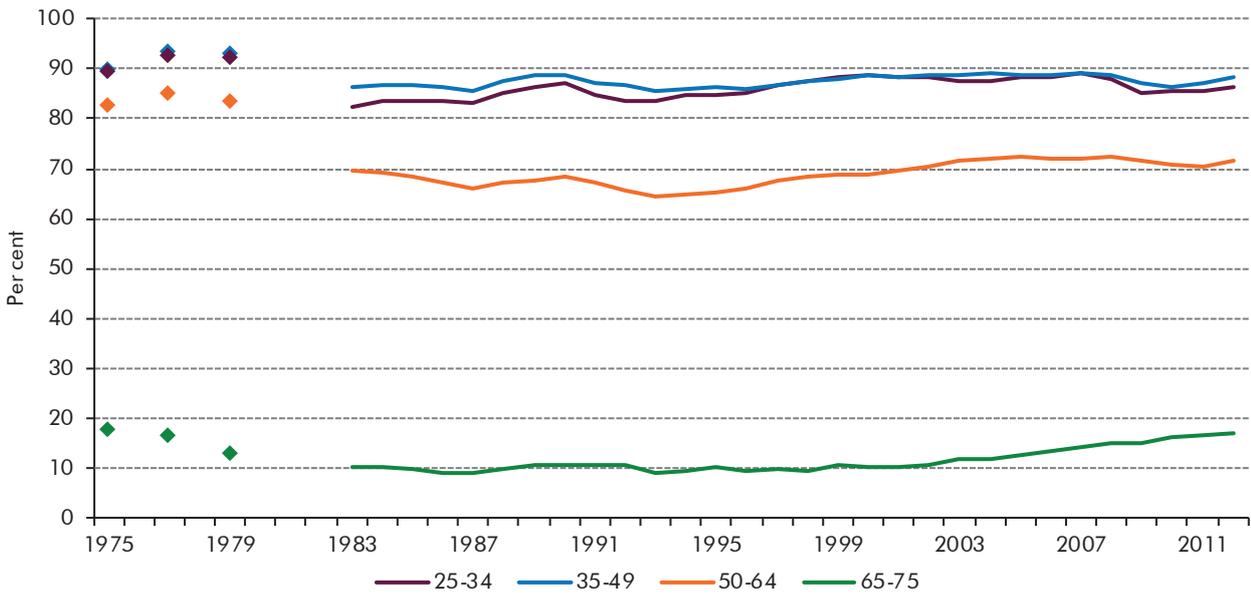
- employment rates are cyclical, but also subject to structural changes in inactivity over time. For example, the employment rate for working age males only gradually recovered in the mid-1990s, as the proportion of inactive men declaring themselves as sick or in ill health remained relatively high;
- the share of older people in employment continues to climb;
- unemployment rates tend to be highest amongst the young, but even greater numbers are still in education; and
- the gender employment gap has been narrowing, as female employment rates – particularly amongst women of childbearing age – have been increasing over the past 30 years.

We also discuss trends in self-employment, which cut across a number of these themes.

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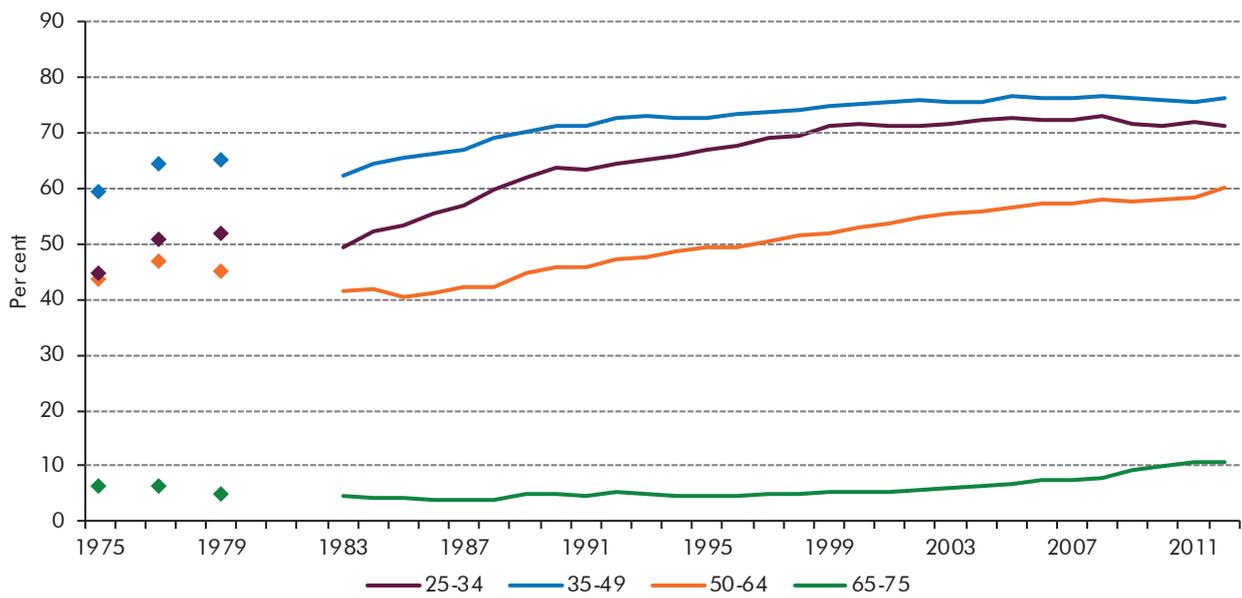
<sup>1</sup> The proportion of the population that is unemployed is a slightly different measure to the more commonly cited LFS unemployment rate, which measures the unemployed as a share of the active population (employed and unemployed) not the total population (employed, unemployed and inactive).

Chart A.4: Male employment rates by age group



Prior to 1983, the Labour Force Survey does not contain an annual time series for these indicators, so only available years are shown. Source: ONS

Chart A.5: Female employment rates by age group



Prior to 1983, the Labour Force Survey does not contain an annual time series for these indicators, so only available years are shown. Source: ONS

Table A.1 Proportion of men employed, unemployed or inactive in 2013Q4

	Per cent of relevant population												Total
	16-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+	
Employed	31	66	85	89	89	88	87	85	78	56	26	6	65
Unemployed	15	14	8	5	4	4	4	4	4	3	1	0	5
Inactive	53	20	7	6	7	8	9	11	18	40	73	94	30
of which:													
Student	48	15	2	1	0	0	0	0	0	0	0	0	5
Family reasons	0	0	1	1	1	2	1	1	2	2	1	0	1
Sick or injured	2	3	3	3	4	5	6	7	9	14	7	0	5
Retired	0	0	0	0	0	0	1	1	6	23	64	94	19
Other	3	2	1	1	1	1	1	1	1	2	1	0	1
Total	100	100	100	100	100	100	100	100	100	100	100	100	100

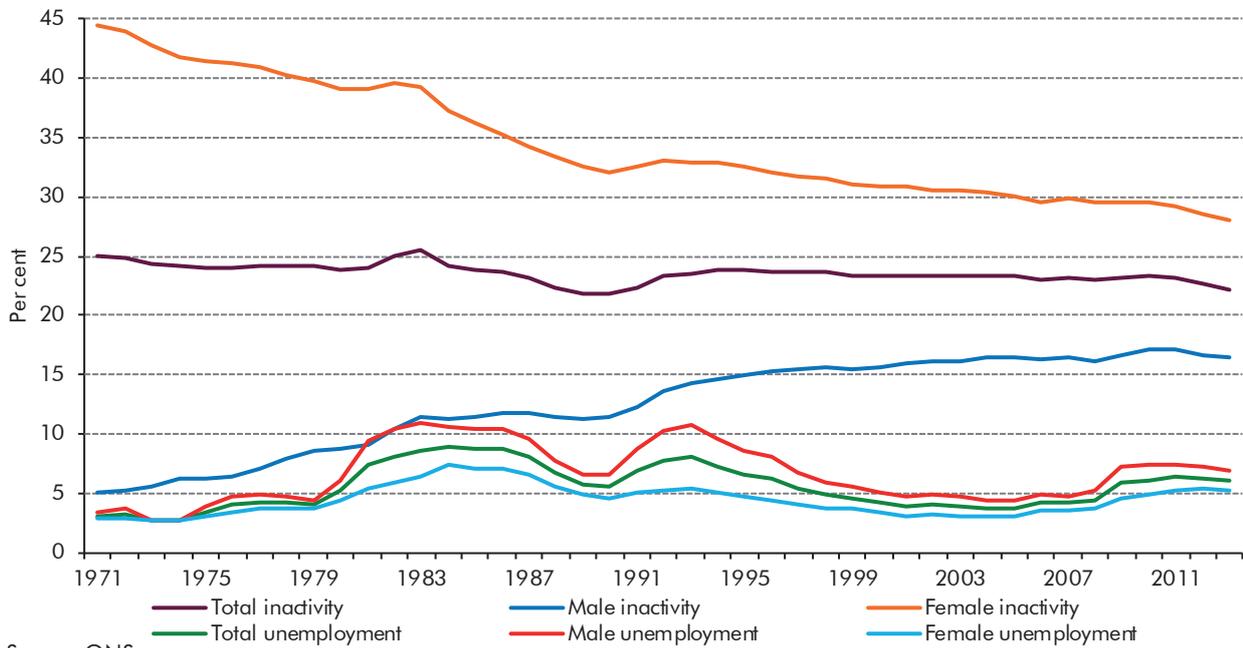
Table A.2 Proportion of women employed, unemployed or inactive in 2013Q4

	Per cent of relevant population												Total
	16-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70+	
Employed	36	63	72	73	75	77	78	78	68	39	17	3	54
Unemployed	12	10	5	4	4	4	4	3	3	1	1	0	4
Inactive	52	27	23	22	21	19	18	19	29	60	83	97	42
of which													
Student	45	14	3	2	1	1	0	0	0	0	0	0	4
Family reasons	2	9	15	17	15	11	9	6	7	6	3	0	8
Sick or injured	1	2	3	2	4	6	7	9	11	9	7	0	5
Retired	0	0	0	0	0	0	1	2	8	43	72	97	24
Other	3	2	2	1	1	1	2	2	2	2	1	0	1
Total	100	100	100	100	100	100	100	100	100	100	100	100	100

## Non-employment

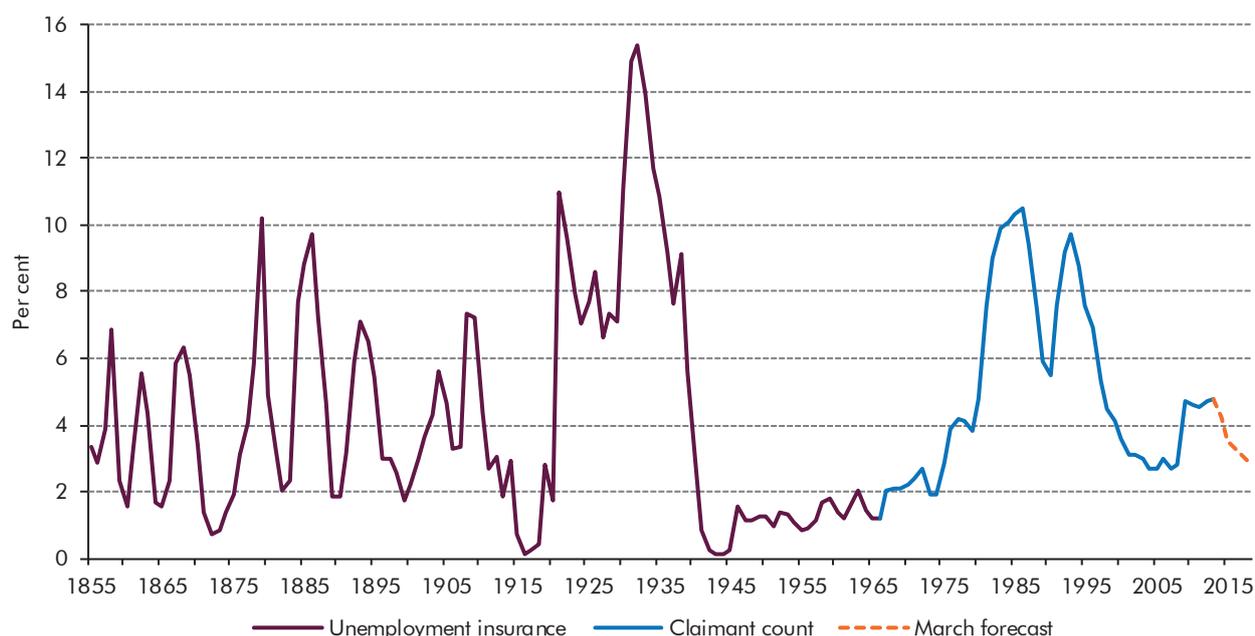
A.16 Chart A.6 shows the past proportions of men and women between 16 and 64-years old that were either unemployed or were not active in the labour market. Greater numbers of people are inactive, but the fluctuations in unemployment tend to be larger, particularly for men in the early 1980s and early 1990s recessions.

Chart A.6: Inactivity and unemployment rates (aged 16-64)



A.17 Chart A.7 gives a longer historic perspective on these fluctuations in the unemployment rate, using past estimates for unemployment insurance claims and the more recent claimant count, which currently reflects the numbers claiming jobseekers allowance (JSA), though the precise definition has changed over time as unemployment benefits have been reformed. After the high unemployment of the Great Depression, it shows the unemployment rate gradually drifting up during the post-WWII period, and jumping during the recessions of the 1980s and 1990s, and to a much lesser extent in the late 2000s. We expect the claimant count rate to fall over the medium term, as the economy recovers.

Chart A.7: Unemployment insurance and claimant count rates



Source: Bank of England, ONS, OBR

- A.18** The claimant count measure of unemployment differs from the internationally comparable LFS measure. Although the two measures peaked at similar levels during the 1990s recession, a gap has opened up since, with the claimant count roughly 1 million below the LFS measure since 2010. This reflects changes in eligibility for, and take-up of, JSA, as well as differences in coverage – such as the LFS measure capturing students looking for part-time work and pensioners that are not entitled to JSA, and the claimant count including some low earners who are in work.
- A.19** Rates of unemployment among young people tend to be far more cyclical, and higher on average, than for the rest of the workforce. There is some evidence that being unemployed at a young age has a disproportionate impact on future employment and wage prospects, due to the loss of potential experience and possible signalling effects.<sup>2</sup> (And that the young may do particularly well during booms.<sup>3</sup>) Our long-term projections assume that the equilibrium unemployment rate will remain constant in the long term, without taking an explicit view on what this implies for particular age groups. Table A.3 shows the sensitivity of our JSA projections to varying this long-term assumption.
- A.20** While the unemployment rate has fluctuated over time, the total inactivity rate has been much flatter over the past 40 years (see Chart A.6). But this masks diverging trends in inactivity among women (falling) and men (rising). The fall in female inactivity has been matched by higher employment (rather than unemployment), and is mainly due to a declining share being out of the labour market to look after family, which we discuss further below. Women are still more likely than men to be inactive for family reasons, and their

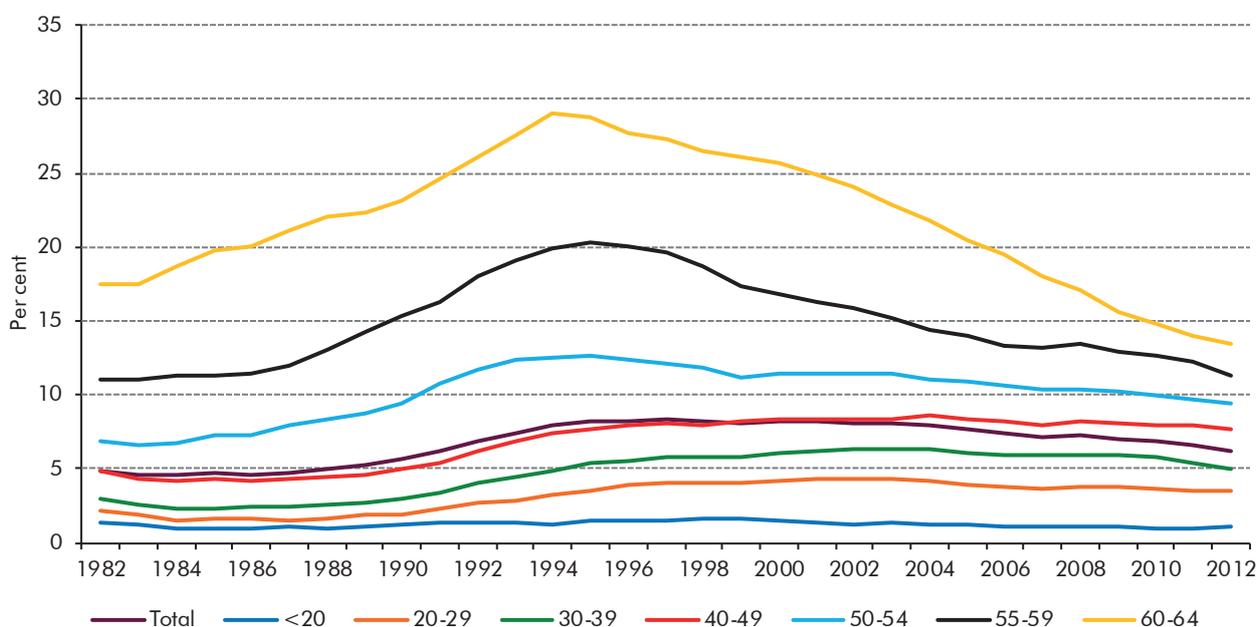
<sup>2</sup> See for example, Gregg and Tominey (2004) and Bell and Blanchflower (2009).

<sup>3</sup> See for example, Freeman and Rodgers (1999) for a study of the US recovery in the 1990s.

employment rates therefore remain below those for men (even abstracting from differences in retirement age; see Tables A.1 and A.2).

- A.21 The proportions of men that were inactive or unemployed were broadly comparable in the early 1980s, but while the unemployment rate gradually declined through the 1980s, the inactivity rate held firm, before edging higher in the early 1990s. Much of the increase over this period reflected an increase in inactivity due to reported sickness or ill health. The male inactivity rate has gradually increased since, mainly due to younger men staying in education for longer (a factor also common to women).
- A.22 The earlier rise in male inactivity was associated with a sustained increase in the numbers claiming incapacity benefits from the mid-1980s through to the mid-1990s, which may have been related to the tightening of the unemployment benefit system from the mid-1980s and to other structural changes in the labour market – in particular a reduction in the relative demand for lower-skilled workers. It did not appear to be related to an underlying increase in the prevalence of long-term sickness.<sup>4</sup> Incapacity benefits were more generous and had fewer conditionality requirements than unemployment benefits. Earnings-related additions made it even more attractive for older men, and many in effect chose to use this support to retire earlier from the labour market. Reforms to incapacity benefits introduced in 1995 tightened eligibility requirements and reduced the generosity of the benefit, leading to the declines in take-up shown in Chart A.8.<sup>5</sup>

Chart A.8: Proportion of men claiming incapacity benefits by age group



Source: DWP

- A.23 The drop has been most pronounced among men just below the retirement age – the share of men in prime age claiming incapacity benefits has remained broadly flat. The relative

<sup>4</sup> See for example, Nickell (2004).

<sup>5</sup> These trends are discussed more fully in Banks *et al* (2012), Banks *et al* (2014), and Nickell (2004).

decline partly reflects the fact that older men were disproportionately affected by the 1995 reforms, but also reflects cohort effects and improvements in health at older ages. Our long-term projections for incapacity benefits rise as a share of GDP as the population ages. This is consistent with recent evidence that the number of women in their early 60s claiming working-age incapacity benefits has risen since the female SPA increased.

- A.24 Table A.3 sets out how sensitive our long-term projections for unemployment, incapacity or disability benefits are to an additional 1 per cent of the working-age population claiming each type of benefit in 2063-64. These projections are based on the system prior to the introduction of universal credit, with the additional costs of universal credit added on top. For each type of benefit, raising the caseload by that margin (just under ½ million people) would have a relatively large effect in proportion to the projected amount of spending on that benefit, but relatively small in terms of total public spending. These simple sensitivities do not take into account possible interactions between different benefits.

Table A.3 Sensitivity of working age benefits to future take-up

	Spending (per cent of GDP)		Caseload (millions)		Population 16-SPA (millions)	Impact on spending (per cent of GDP) <sup>1</sup>
	2018-19	2063-64	2018-19	2063-64	2063-64	2063-64
Unemployment benefits	0.2	0.2	0.8	0.9	46.3	0.08
Incapacity benefits	0.7	0.9	2.2	2.8	46.3	0.14
Disability benefits	0.4	0.4	1.6	2.0	46.3	0.10

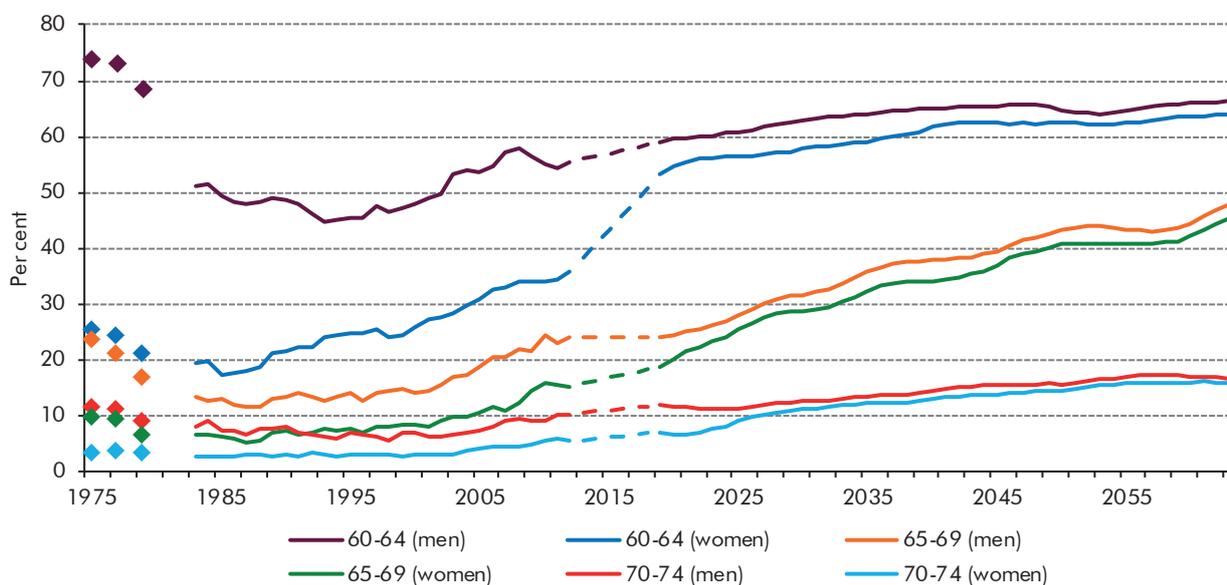
<sup>1</sup> Additional spending if an extra 1 per cent of the working age population claimed benefits.

## The older population

- A.25 The employment decisions of older people will be affected by a range of factors, including healthy life expectancy, the legislative context and financial considerations. In recent years, legislative changes have included announced rises to the SPA and the compulsory retirement age for men and women being phased out. Financial considerations have been affected by the wealth effects associated with the crisis and recession, and the historically low annuity rates currently available.
- A.26 Our long-term employment rate projections for 60 to 74-year olds are shown in Chart A.9 (our medium-term employment forecasts are produced at a whole economy level rather than by age, so we start our projections with an estimate of age-specific employment rates that would be consistent with the whole economy employment rate at the end of the medium-term forecast). As explained above, our projections capture cohort effects and a rising SPA. Modelling these two factors alone would suggest that employment rates for men aged 60 to 64 years will continue rising over time, although slightly more gradually than in the recent past, and ending the period below the level seen in the 1970s.
- A.27 Employment rates for women of the same age are projected to pick up more significantly over the next five years, as the SPA age is equalised. And SPA changes are also projected to

raise the shares of both men and women working into their late sixties. We do not assume that this pace of change continues into later life.

Chart A.9: Employment rates for 60 to 74-year olds



Prior to 1983, the Labour Force Survey does not contain an annual series for these indicators, so only available years are shown. Our medium-term forecast is produced top-down, not bottom-up, so the dotted lines for that period are a simple linear interpolation. Source: ONS, OBR

**A.28** A higher SPA will reduce the total amount of state pension payments each individual may expect to receive, which in itself might prompt a small and gradual labour market response. But SPA changes tend to be associated with discrete changes in participation rates around the pension age itself, which may suggest other factors are more important, such as signalling effects; expectations of retirement may be anchored around that point. The increase in women’s SPA to 61 (on its way to 65 in 2018) has been associated with an increase in participation rates for those affected.<sup>6</sup> However, most people do not retire at the SPA precisely, and retirement ages have been drifting upwards over the recent past, despite the SPA not having previously changed since 1940 (when the female SPA was reduced to 60). There are clearly many other factors that determine retirement decisions.

**A.29** Some of these will be specific to the individual. Estimates for disability-free life expectancy have increased over time – although by less than overall life expectancy – which will have facilitated longer spells in employment. There is also clear evidence that couples make joint retirement decisions, choosing to retire at similar points in time.<sup>7</sup> And higher levels of education are also associated with working for longer.<sup>8</sup> A relatively larger service sector, developments in technology and self-employment becoming a more viable alternative may also have opened up options for some people to work for longer.

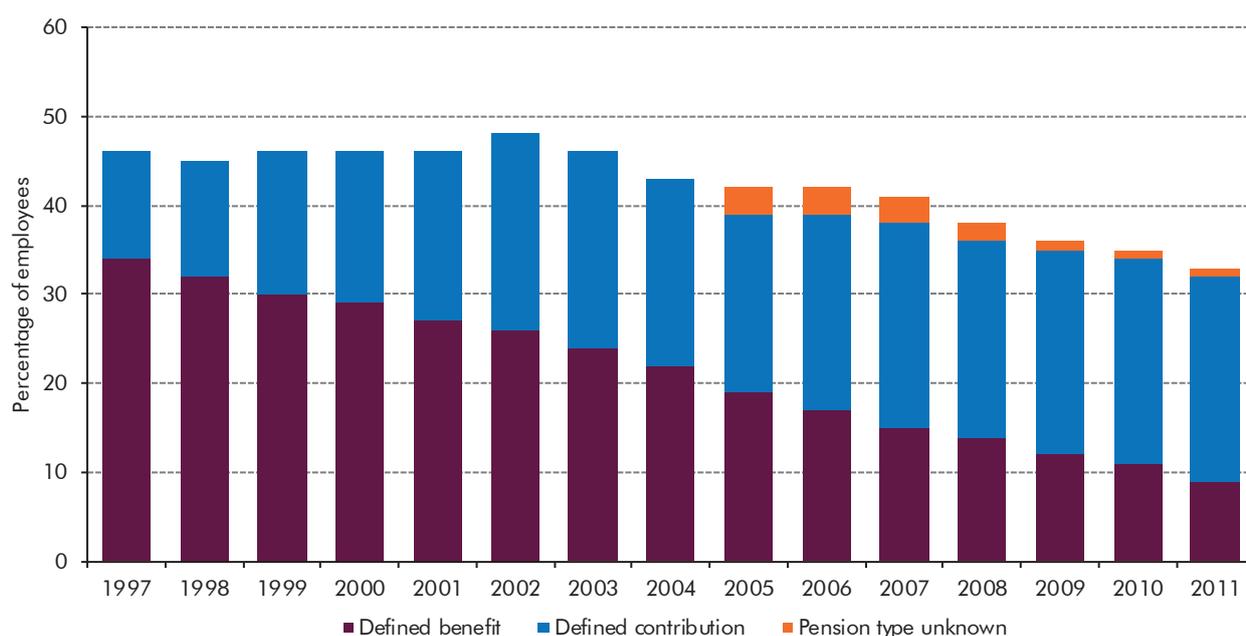
<sup>6</sup> See for example Cribb *et al* (2014).

<sup>7</sup> Cribb *et al* (2014) suggests participation rates of partners have also moved following the recent increase in the female SPA. See Banks *et al* (2010) for a broader discussion in the UK context.

<sup>8</sup> See for example Burtless (2013) for a discussion of US trends.

A.30 Decisions are also unsurprisingly closely associated with pension arrangements and broader expectations of post-retirement incomes. As Chart A.10 shows, the share of private sector employees receiving a defined benefit pension has continued to decline over recent years. Defined benefit schemes tend to have sharper incentives to retire, and contributions – and therefore the pension pot at retirement – tend to be higher on average.<sup>9</sup> Pensions from defined contribution schemes are more sensitive to the financial returns on the fund.

Chart A.10: Membership of private sector defined benefit and defined contribution schemes



Source: NAO

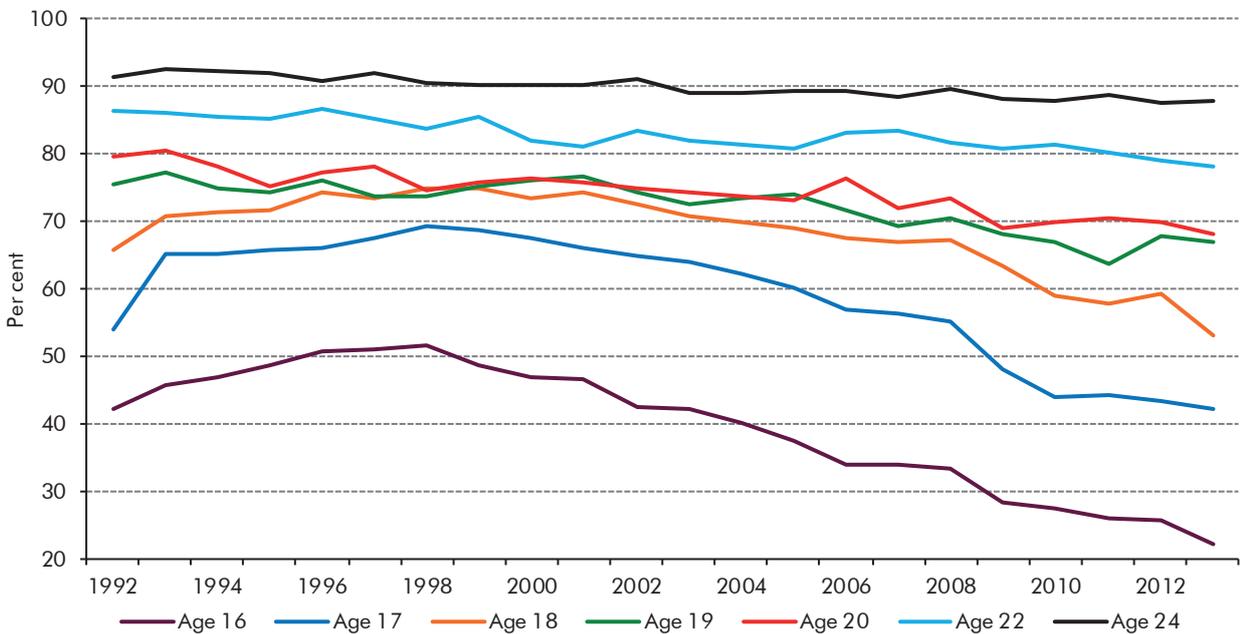
A.31 The value of pension assets fell through the financial crisis, and annuity rates are currently much lower than the pre-crisis period. Downwardly revised expectations of future real incomes will have delayed the retirement choice for some people, explaining part of the rise in the share of older people continuing to work. However, it is difficult to unpick this cyclical element from other more structural factors. The Budget 2014 policy announcement on pensions flexibility, discussed in Chapter 3, presents a further source of uncertainty.

## The younger population

A.32 Although youth unemployment is relatively high for those seeking work, a greater number of under-25s are currently not active in the labour market (see Tables A.1 and A.2). Charts A.11 and A.12 show participation rates for men and women aged between 16 and 24. Participation rates rise sharply around school-leaving age and then continue to climb across the early years of working life. Another feature of the recent data has been the pronounced fall in participation rates for 16 and 17 year olds over time, with smaller downward trends among 18 to 20 year olds. Participation rates by age 24 have been more stable across time.

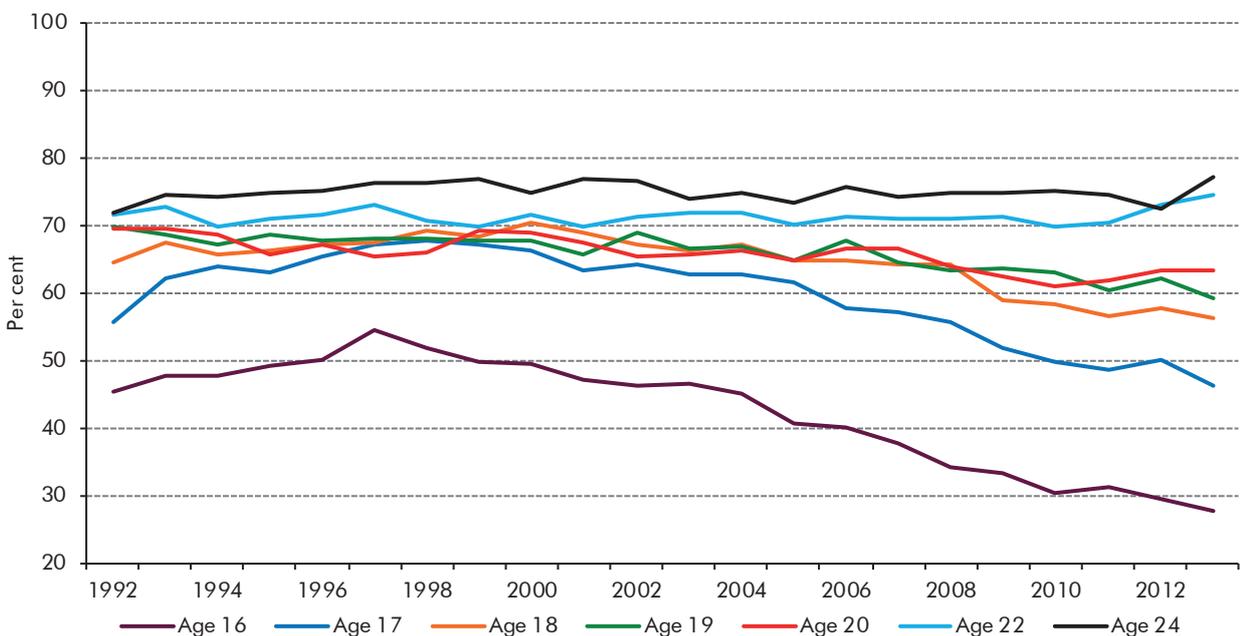
<sup>9</sup> See for example Blundell *et al* (2002).

Chart A.11: Male participation rates for younger people



Source: ONS

Chart A.12: Female participation rates for younger people



Source: ONS

A.33 These trends are closely related to the greater proportion of young people remaining in education. We expect this trend to continue over the next few years, as the school leaving age increases to 18 in 2015, and the cap on student numbers attending higher education in England is removed around the same time. Our projections assume that the proportions in education remain constant in the long term, so a continuation of past trends would lead to additional education spending and student loans financing.

- A.34 Annex B discusses student loans in more detail, and includes a ‘younger age structure’ variant, where the proportions in higher education are greater than in our central projections. That particular scenario is motivated by an alternative set of population projections (in which fertility rates are higher), but it would also give an indication of the impact if the proportion of students in given cohorts ended up being higher.
- A.35 As described above, our employment model applies fixed age-specific entry and exit rates to each cohort as they age over time. Given the recent downward trend for young people, applying these entry rates mechanically to younger cohorts would lead to permanently lower participation rates in future, which we do not consider realistic. To avoid that outcome in the model, we assume these cohorts’ participation rates will catch up to their predecessors through their early twenties. But we do not assume that remaining in education for longer leads to relatively higher participation in future.

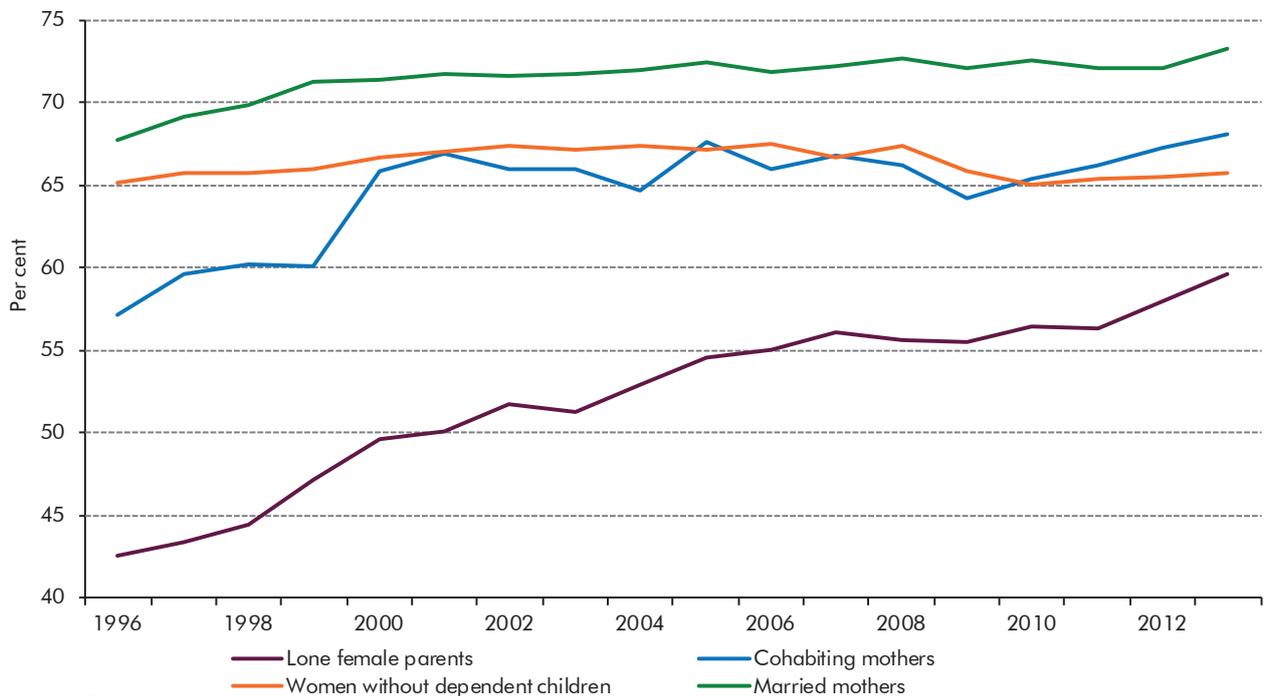
### Working-age women

- A.36 We have already discussed above that the counterpart to increasing female employment rates has been a reduction in the proportion of women inactive for family reasons. Our long-term projections lock-in these cohort effects, so for example as we show in Chart A.1, we project women born in the 1980s to have higher participation rates than women born in the 1970s across all comparable ages. But we do not assume that female cohorts yet to enter the labour market have even higher participation rates.
- A.37 Chart A.13 shows employment rates by parental status and suggests that married and cohabiting mothers now have higher employment rates than women without dependent children. However, to some extent that picture is misleading, as it does not control for other factors, for example that women without dependent children will disproportionately be young and therefore likely still to be in education. A more useful message to take away is that employment rates for lone parents lag behind mothers with partners, but that this gap has been closing over the recent past. Some of the recent increase may relate to lone parent obligations, which gradually reduced the entitlement to claim income support until the youngest child reached 5, rather than 16, between November 2008 and May 2012.<sup>10</sup>

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<sup>10</sup> See DWP (2013b).

Chart A.13: Female employment rates by parental status (16-64 population)



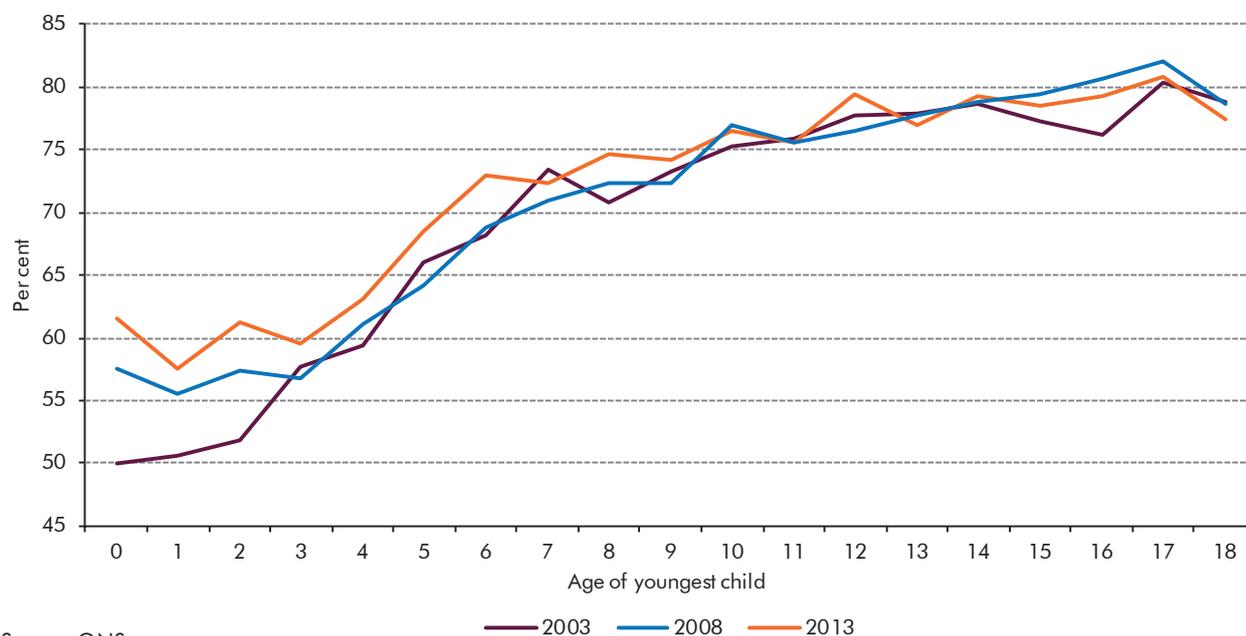
Source: ONS

A.38 Chart A.14 shows that, unsurprisingly, mothers’ employment rates tend to increase as their youngest child ages. It also illustrates that women have, on average, been returning to employment at earlier stages after giving birth, a pattern which goes back to at least the late 1980s. Charts A.13 and A.14 accord with past evidence in the US.<sup>11</sup> Female employment rates in the US have however flattened since the 1990s, and fell along with male employment rates during the recent recession.<sup>12</sup>

<sup>11</sup> See for example Laughlin (2008).

<sup>12</sup> See Cohn et al (2014).

Chart A.14: Mothers' employment rates by age of youngest child



Source: ONS

- A.39** There are numerous factors that may underly the increasing trend over time. Just as retirement decisions will be co-ordinated between partners, so will the choice as to whether and when both enter the labour market. For couples, lower marginal tax rates on second incomes will be one factor. The opportunity cost of staying at home will also have risen for other reasons, for example that levels of education and time spent in work before giving birth have increased over time (and that incomes tend to rise with experience). More broadly, the gender wage differential has been narrowing.<sup>13</sup> And it is increasingly viable to remain in work due to a number of factors, including greater efficiencies in home production,<sup>14</sup> more childcare options, and a broader range of flexible work becoming available, as the service sector has expanded and self-employment becomes more practical.
- A.40** If female employment rates were higher than projected, then ultimately spending would also be higher in certain areas. Increased time in work increases entitlement to certain benefits at the margin, such as state pensions. But it may also lead to a partial reduction in other spending – such as pension credit (if other pensions are higher as a consequence of working for longer). Women are also more likely to provide informal long-term care support, so more of this may then need to be provided by government. Public spending on childcare support would also be expected to rise.
- A.41** Most spending on childcare support comes through direct funding for under 5-year olds, but support is also currently provided through tax credits and employer supported care. These funding sources are expected to change over the next few years: free part-time support is being extended for a greater number of two-year olds by September 2014; support under universal credit will be more generous than under tax credits, with no

<sup>13</sup> See for example Olivetti (2006), Attanasio *et al* (2008), Albanesi and Sahin (2013) and ONS (2013d).

<sup>14</sup> See for example, Greenwood *et al* (2005).

working hours constraint and 80 per cent of costs being met for eligible households (against 70 per cent under tax credits); and tax-free childcare is to replace employer supported childcare over time, at an estimated additional cost of £0.9 billion by 2018-19. These changes may affect women’s employment decisions at the margin, although a broad range of literature suggests that making childcare relatively cheaper is more likely to increase the prevalence of formal childcare, with only a negligible impact on labour supply.<sup>15</sup>

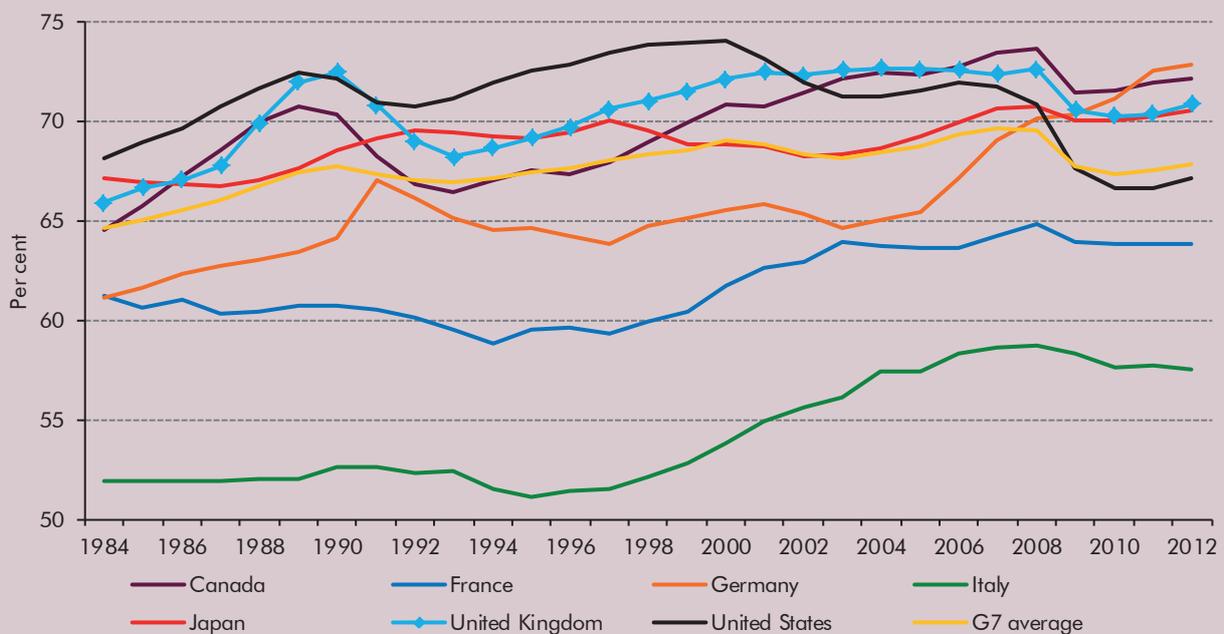
A.42 Box A.1 provides an international comparison of employment rates, and in particular highlights that an increasing proportion of women in work is a common theme across countries.

**Box A.1: International comparisons of employment**

Earlier this year, the Chancellor expressed an ambition “to have more people working than any of the other countries in the G7 group”.<sup>a</sup> Chart A shows working age (15-64) employment rates for the G7 economies since 1984. On this measure, the UK’s employment rate has typically been above the G7 average, but rarely in top spot.

Economic cycles have not always been synchronised, and even when they have been, short-term labour responses have differed. As an example, over the most recent recession the US response was dominated by significantly lower employment levels, whereas in Germany it was average hours that fell steeply. In the UK, employment and hours held up, while productivity was hit particularly hard. These differences complicate cross-country comparisons.

**Chart A: Working-age employment rates**



Source: OECD

<sup>15</sup> See for example Brewer et al (2014), for a summary of the existing literature.

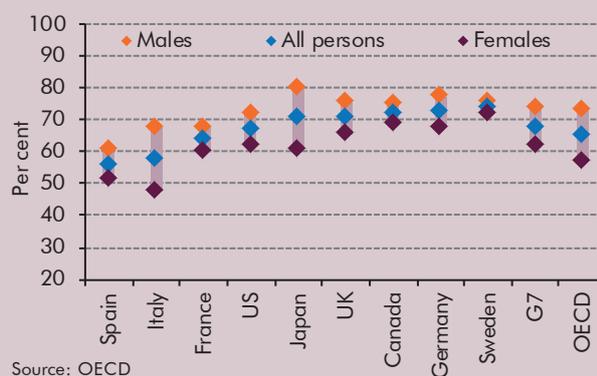
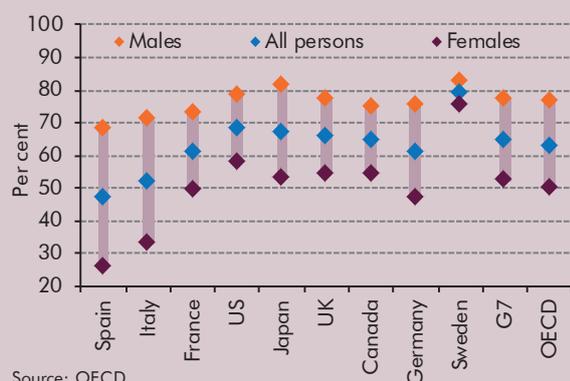
Underlying potential employment, and the movements around it, will also reflect a range of longer-term phenomena, including social, industrial and legislative factors that differ across countries. Charts B and C show working-age employment rates by gender in 1984 and 2012, highlighting one common theme across most countries, but also the degree of variance.

In 1984 the gender employment gap for the G7 as a whole stood at over 25 per cent, with the UK gap slightly narrower. Within OECD countries there were substantial differences between countries like Spain with a gap of over 40 per cent and Sweden at just 7 per cent. By 2012, the G7 employment gender gap had halved to around 12 per cent, narrowing across the board, as female employment rates rose substantially, and male employment rates fell off slightly (some of which will have been cyclical). But female employment rates in the G7 still lag Scandinavian economies, and the gap remains relatively large in countries such as Japan and Italy. In the case of Japan, the overall average is boosted by higher male employment rates, while Italy also lags in that respect.

Furthermore, employment rates differ by age. In 2012, the UK had the second highest employment rate for 15-24 year olds in the G7 (after Canada), was towards the top for the 25-54 year age bracket, but closer to the average for 65+ year olds, headed by Japan and Germany – both economies that have been ageing at a quicker rate than the UK.

Chart B: Employment rates in 1984

Chart C: Employment rates in 2012



These international comparisons demonstrate the scope for labour market outcomes to differ substantially, which illustrates the degree to which the labour market assumptions that underpin our long-term projections could vary over time. For example, long-term fiscal sustainability could be boosted were the UK to close the gap with some OECD countries in terms of the gender employment gap or employment rates among the 65+ population.

<sup>a</sup> Chancellor’s speech delivered on 31 March in Tilbury Port, Essex.

## The self-employed

- A.43 Total employment has held up much better in this recession and recovery than might have been expected given the weakness of output growth. Some of this strength reflects growth in the number of self-employed, which continued to rise through the recession and seems to

have gathered even more pace in recent quarters. Higher numbers in self-employment account for around 70 per cent of employment growth since the start of the recession. Chart A.15 shows the self-employment share of total employment since the early 1990s, which has risen from around 12 per cent of the total workforce in the early 2000s to around 15 per cent today. This period was pre-dated by a rise through the 1980s.<sup>16</sup>

Chart A.15: Self-employment as a share of total employment



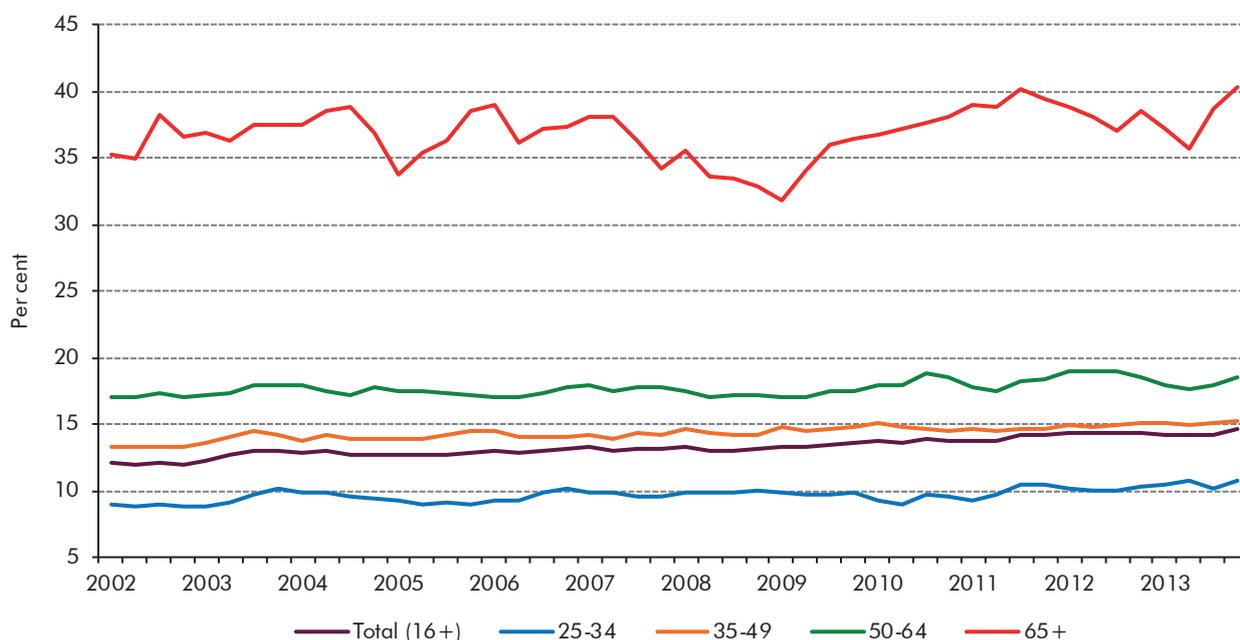
Source: ONS

- A.44** There may be cyclical reasons for an increase in self-employment numbers, including weak labour demand from firms, weak real income growth driving participation among second earners, and crisis-related loss of wealth and low post-crisis annuity rates affecting those near retirement. The more recent surge is also related to the recovery in the construction sector, which has higher rates of self-employment and has accounted for a fifth of the rise in self-employment over the past year. Improved credit conditions may also have supported people who wish to be self-employed. To the extent that there has been a cyclical component to the rise, it is possible the share might decline gradually as the economy recovers, as was the case from the mid-1990s.
- A.45** It is unclear how some longer-term trends that have affected the share in the past will play out in future, such as the shift from manufacturing to services and access to financial capital, which are thought to have supported the rise during the 1980s.<sup>17</sup> What is clear is that a larger proportion of older aged groups tend to be self-employed, as shown in Chart A.16, so the UK's demographics would be expected to raise self-employment over time.

<sup>16</sup> See for example Cowling and Mitchell (1997).

<sup>17</sup> See for example Meager (2007).

Chart A.16: Self-employment as a share of total employment by age groups



Source: ONS

- A.46** The compositional effect of an ageing population helps to explain the steady rise in self-employment through the mid-2000s, but demographic factors can only explain a small part of the steeper rise since 2009. The remainder is explained by increasing self-employment rates within specific age and gender brackets. There have been larger movements within older age groups and among women – groups that have seen their share of the workforce climb, as discussed above. It is difficult to judge in real-time whether this is an extension of past trends, for example the rise in the female SPA has coincided with a steeper rise in the share of older women that are self-employed, or cyclical factors.<sup>18</sup>
- A.47** Lower effective tax rates on income for the self-employed relative to employees is likely to explain some of the rise in the early 2000s. There have not been significant further changes more recently, but the tax and benefit system is likely to continue to affect people's employment choices. Changes in personal tax allowances and welfare reforms may have encouraged additional labour participation, but it is not obvious that this would disproportionately encourage self-employment. Schemes that potentially do so, such as the new enterprise allowance, are on too small a scale to explain much of the increase we have seen at the whole economy level.
- A.48** Entitlement to the working element of tax credits may have encouraged people to declare themselves self-employed. The proportion of working tax credits claimants that are self-employed has been on an upwards trend, rising from 17.9 per cent in 2007-08 to 19.6 per cent in 2010-11 and 24.5 per cent in 2012-13. To a large extent this will simply be a reflection of the rising numbers in self-employment, and, as we will go on to discuss, that self-employment incomes tend to be skewed towards the lower end of the distribution. The

<sup>18</sup> See for example, box 'Self-employment and labour market slack', Bank of England (2014b) and Goodhart *et al* (2014) for further analyses of recent data.

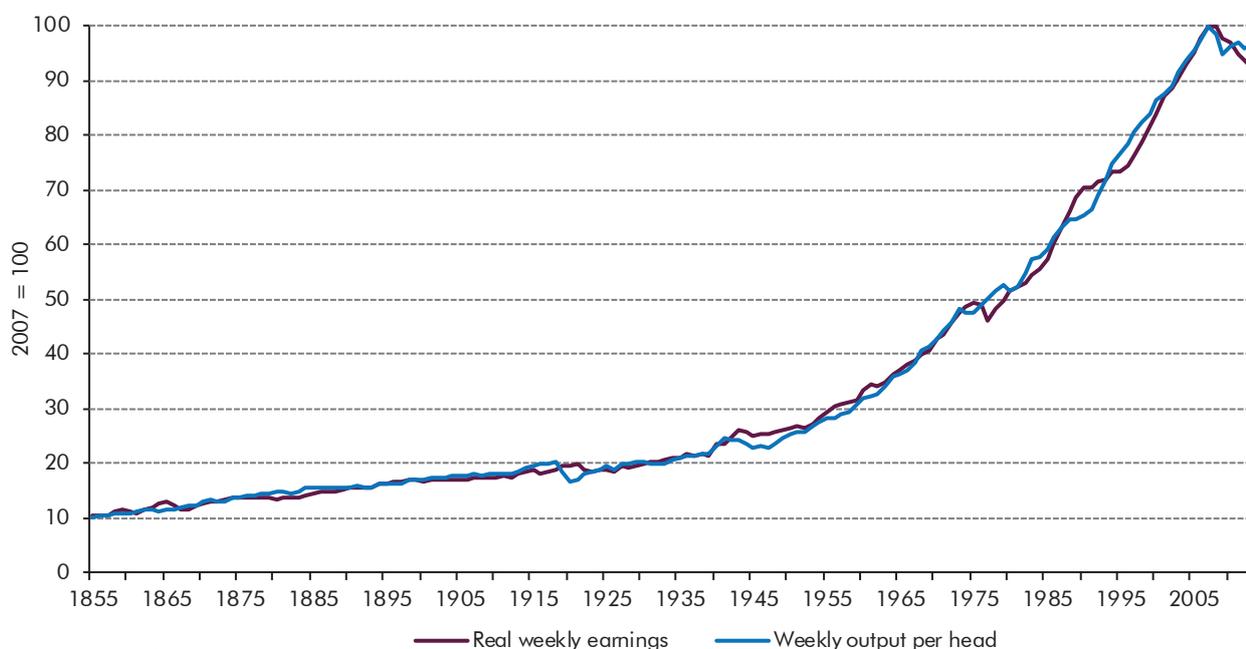
removal of the second income taper in April 2012, taking higher earners out of the system, also therefore explains much of the rise in 2012-13 because it disproportionately affected employees.

## Earnings

### Productivity

A.49 In the long run, earnings growth is determined by productivity growth. Chart A.17 shows how real wage growth and productivity growth have averaged around 2 per cent a year over the past 50 years. It also shows the unusual period of falling real wages and productivity in the UK since the financial crisis of 2008.

Chart A.17: Real wages and productivity



A.50 As well as the broader implications for living standards, falling real wages interact with a tax system that is indexed to inflation to deliver a falling effective tax rate on wages and salaries. In normal times, as wages rise faster than inflation, people find more of their income subject to tax at higher marginal tax rates – a process known as ‘fiscal drag’ that is described in Box 3.2. When real incomes are falling, fiscal drag works in reverse, with a larger proportion of income taxed at lower marginal tax rates.

A.51 Despite falling real wages, policy changes by the current Government have led to the proportion of taxpayers paying higher tax rates on some of their income rising markedly in recent years. This is discussed further below. We expect productivity to pick up gradually through 2014 and 2015, supporting stronger wage growth, and leading to the return of fiscal drag in the final three years of the medium-term forecast period. We do not assume any further fiscal drag beyond 2018-19.

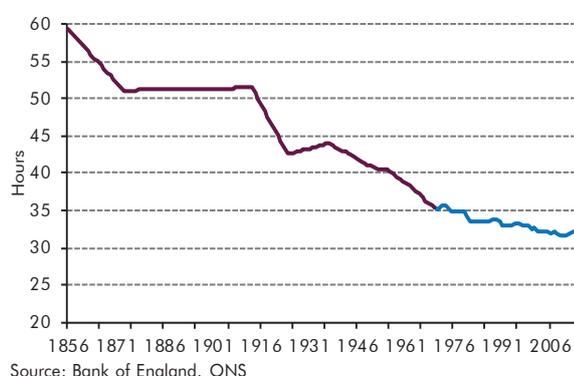
**A.52** Our receipts projections and most elements of spending are linked to average earnings, and therefore productivity, over the long term. Higher or lower productivity growth would therefore leaving our borrowing projections relatively unchanged as a share of GDP, but the impact on living standards would be far greater.

## Average hours worked

**A.53** Earnings per worker are equal to hours worked multiplied by hourly pay. Average hours have been on a downward trend globally for well over a century. This reflects both compositional factors – an increasing share of part-time employment, and a higher share of employment being made up by workers that work shorter average hours, including women and service sector workers – and other factors – including individuals working shorter hours due to higher average earnings and legislative changes.<sup>19</sup>

**A.54** As Chart A.18 shows, this pattern has held true in the UK since the industrial revolution. In this section, we will concentrate on the trend since the early 1990s (Chart A.19). Average weekly hours continued to trend down over much of this period, but have risen in recent years from the trough in mid-2011. Average hours in the first quarter of 2014 were broadly the same as the level a decade earlier.

**Chart A.18: Average weekly hours worked since 1856**



**Chart A.19: Average weekly hours worked since 1992Q2**



**A.55** The downward trend in average hours can largely be explained by men working shorter hours on average, as shown in Chart A.20, rather than a change in the composition of employment towards women, who on average work fewer hours than men. Some of the recent increase in hours reflects a small overall increase in the proportion of women working full-time.

**A.56** There has been a large compositional effect within the male group (Chart A.21), with the proportion of men in part-time employment (working less than 30 hours per week) doubling from 7.4 per cent in mid-1992 to 14.8 per cent in early 2014. The proportion of men that work part-time because they do not want a full-time job has been gradually trending up

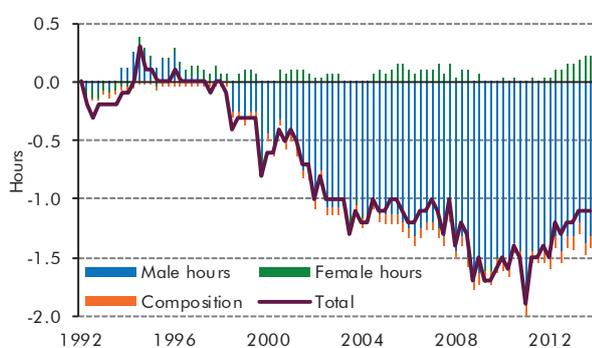
<sup>19</sup> See for example International Labour Office (2007).

## Labour market trends

over time, supplemented since 2009 by an increase in the proportion that wanted, but could not find, full-time work.

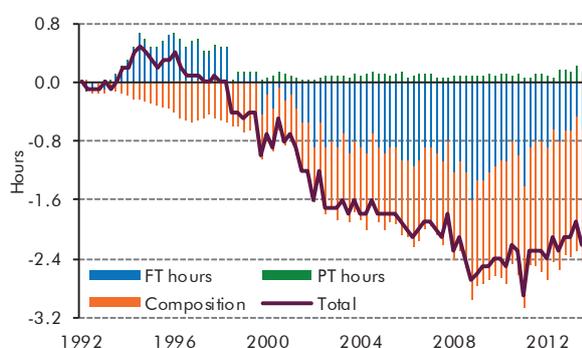
**A.57** Average hours for full-time male workers have also fallen over the period, although partly rebounding in recent years. This mainly relates to the share of men working over 45 hours a week, which fell from around 39 per cent in the mid-1990s to around 28 per cent in 2009, before stabilising. The period coincides with the introduction of the 1998 Working Time Regulation, which set out that firms cannot force employees to work longer than 48 hours a week, unless they agree to do so. The fall has, however, been concentrated among the self-employed, who would not be bound by the regulation.

**Chart A.20: Contribution to the change in average weekly hours since 1992Q2**



Source: ONS

**Chart A.21: Contribution to the change in male average weekly hours since 1992Q2**



Source: ONS

**A.58** The distribution of hours among the self-employed has tended to be more widely dispersed than for employees, with greater proportions of those working low and high hours being self-employed. (A similar picture emerges for home workers.) However, the latest data suggest the top-end is now broadly comparable, with similar proportions of self-employed and employees working over 45 hours a week in 2013. This has little to do with the age composition of the self-employed – who are more likely to be older – and instead probably reflects the fact that the newly self-employed are working fewer hours on average than the stock of existing self-employed people.

**A.59** Underlying these shifts are changes in the industrial composition of employment. At the whole economy level, average hours fell 0.7 hours a week between 1997 and 2013. Lower average hours within industries only contributed around a fifth of the fall, with no single industry making an absolute contribution of greater than 0.1 hours to the change. The main contribution to the fall, at around 0.5 hours, comes from the fall in manufacturing's share of employment and the rise in health, social work and education services. Average hours are higher than average in manufacturing and lower than average in health, social work and education.

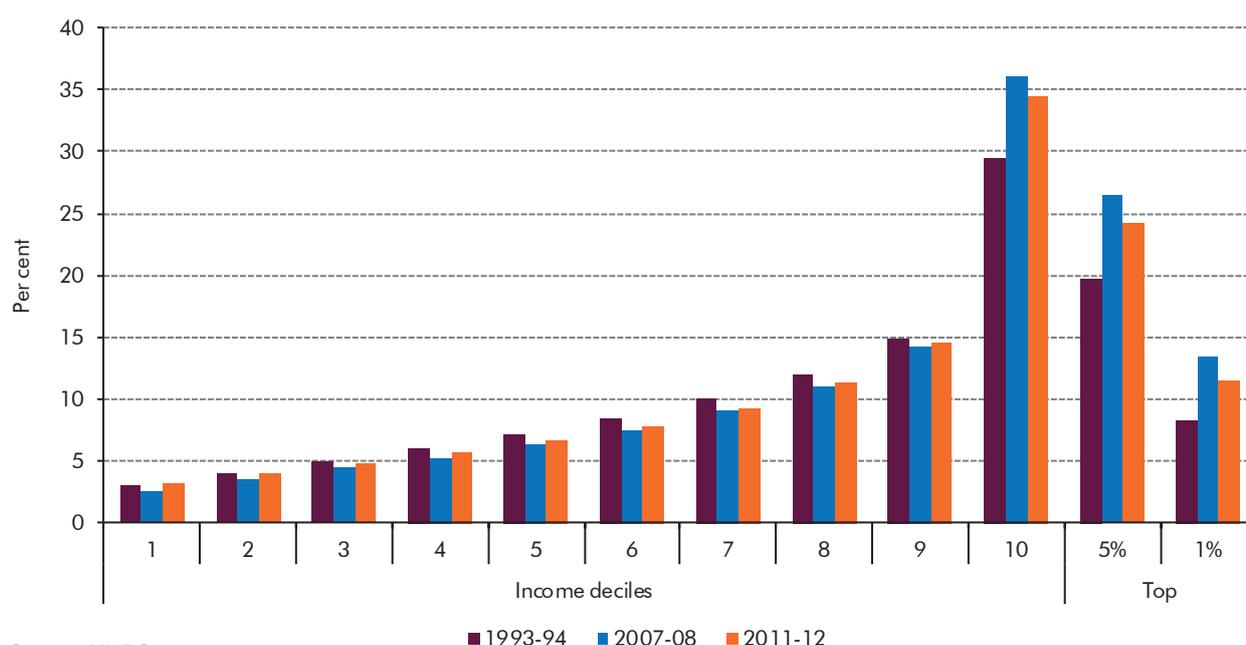
## The distribution of incomes

**A.60** Over the past two decades the distribution of income has widened, with the top 10 per cent of the distribution accounting for a greater proportion of total income. For example, as

shown in Chart A.22, the share of income accounted for by the top 5 per cent of the distribution increased from 19.8 per cent in 1993-94 to 26.4 per cent by 2007-08, before falling to 24.2 per cent in 2011-12 (the latest data point from the HMRC survey of personal incomes).

- A.61** Changes in the share of income have been complicated recently as a result of the introduction of and changes to the additional rate of income tax, which were pre-announced allowing a number of taxpayers to shift income into different years in order to reduce their tax bill. This may have slightly depressed incomes, particularly at the higher end of the distribution, in 2011-12.
- A.62** HMRC projections, based on our latest medium-term forecast, show a rebound in the share of income going to those in the higher end of the distribution. This largely reflects a forecast that savings and investment income, which is more prevalent at the top of income distribution, will grow faster than employment income.

**Chart A.22: Shares of total income (income taxpayers only)**



Source: HMRC

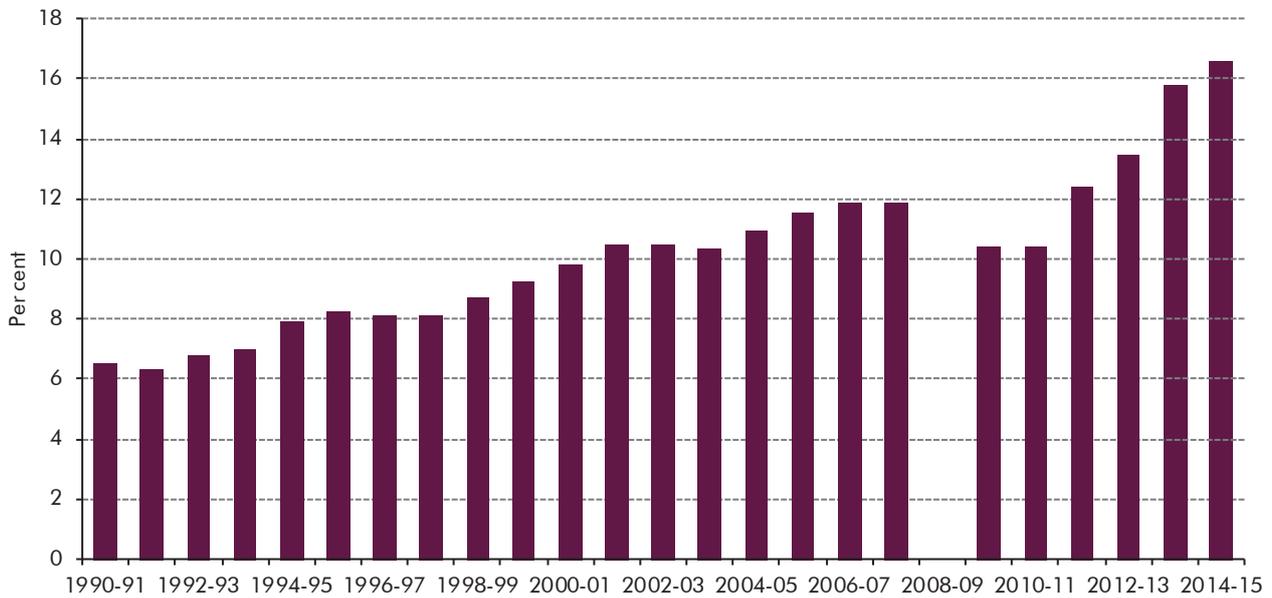
- A.63** HMRC's personal tax model can be used to simulate the effect of changes in the income distribution on income tax and NICs receipts. HMRC has provided an illustrative analysis of the tax effect of changes in the income share for the bottom 50 per cent and the top 5 per cent of income taxpayers. The results are summarised in Table A.4, which shows that income tax receipts are positively correlated with changes at the top of the income distribution, reflecting higher marginal tax rates for those taxpayers, while NICs receipts are positively correlated with changes at the bottom of the distribution, reflecting the lower rate paid on earnings above the upper earnings limit.

Table A.4: Illustrative impacts of changes in taxpayer income distribution in 2018-19

	Percentage point change in the share of income of the top 5 per cent of income taxpayers					
	-3	-2	-1	+1	+2	+3
<b>Change in tax liabilities (£ billion)</b>						
Income tax & NICs	-4.0	-2.7	-1.4	1.4	2.9	4.4
Income tax	-5.9	-4.0	-2.0	2.0	4.1	6.2
NICs	1.8	1.2	0.6	-0.6	-1.3	-1.9
	Percentage point change in the share of income of the bottom 50 per cent of income taxpayers					
	-3	-2	-1	+1	+2	+3
<b>Change in tax liabilities (£ billion)</b>						
Income tax & NICs	4.1	2.6	1.3	-1.2	-2.4	-3.6
Income tax	4.7	3.1	1.5	-1.4	-2.9	-4.3
NICs	-0.6	-0.4	-0.2	0.2	0.5	0.7

- A.64** Although the share of income accounted for by the top of the taxpayer income distribution has fallen since the crisis, the share of total income tax they pay has continued to rise. The income tax take from the top 10 per cent has risen from 54.3 per cent in 2007-08 to 55.4 per cent in 2011-12, and HMRC projections suggest a further rise in the share to 59.6 per cent by 2018-19.
- A.65** The rising share of the tax take from the top end of the income distribution reflects policy measures, such as the introduction of the additional rate of income tax for incomes over £150,000 from 2010-11 onwards (initially at 50p, reduced to 45p from 2013-14), restrictions on pensions tax relief and anti-avoidance measures aimed at higher earners. It also reflects policy changes to the income tax schedule below the highest incomes. Between 2010-11 and 2015-16, the personal allowance will have risen by £4,025 from £6,475 to £10,500. In contrast, the higher rate threshold (the point at which part of income is taxed at 40p) will have fallen by £1,590, from £43,875 to £42,285.
- A.66** Chart A.23 shows that the share of income taxpayers paying some of their income at the higher or additional rate has jumped by around 6 percentage points between 2009-10 and 2014-15 to 16.6 per cent. This reflects both the reduction in the higher rate threshold and the fact that raising the personal allowance has reduced the number of taxpayers. Despite rising employment, the total number of income taxpayers is expected to fall by 1.4 million between 2010-11 and 2014-15.

Chart A.23: Proportion of income taxpayers paying higher and additional rate

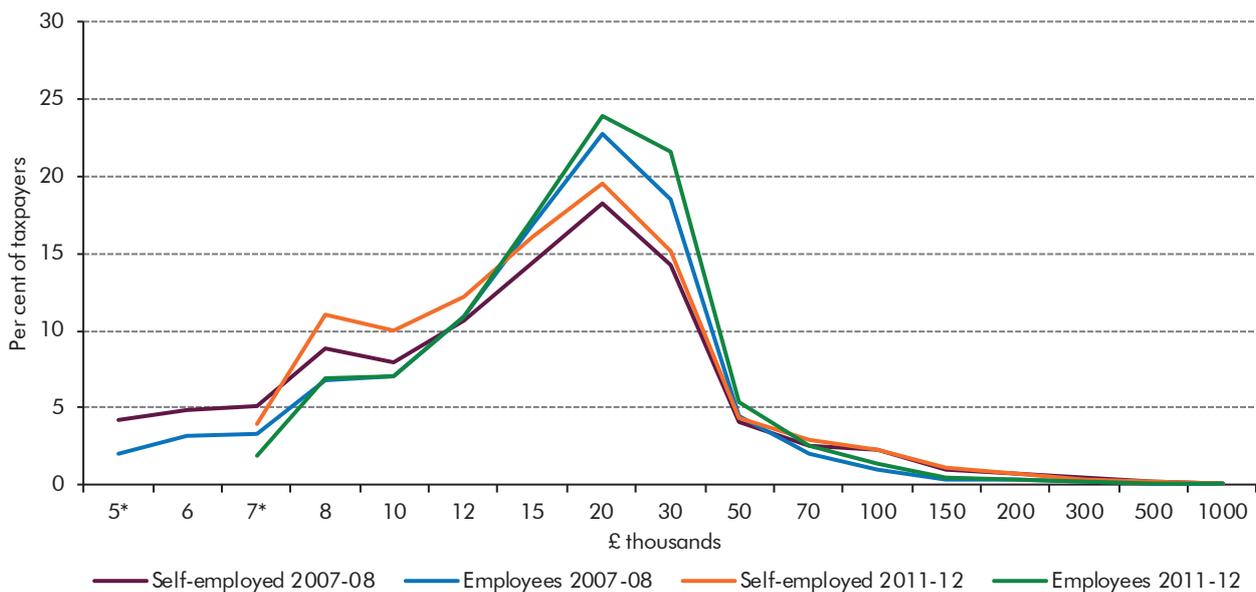


Data for 2008-09 are not currently available. 2013-14 and 2014-15 figures are HMRC estimates.  
Source: HMRC

### Income from self-employment

A.67 The incomes of those who are self-employed tend to be lower than those employed. Chart A.24 shows income distributions of employees and self-employed taxpayers. The self-employed distribution is tilted more towards the bottom end, with 37 per cent of self-employed taxpayers earning less than £15,000 in 2011-12 compared to 27 per cent of employees.

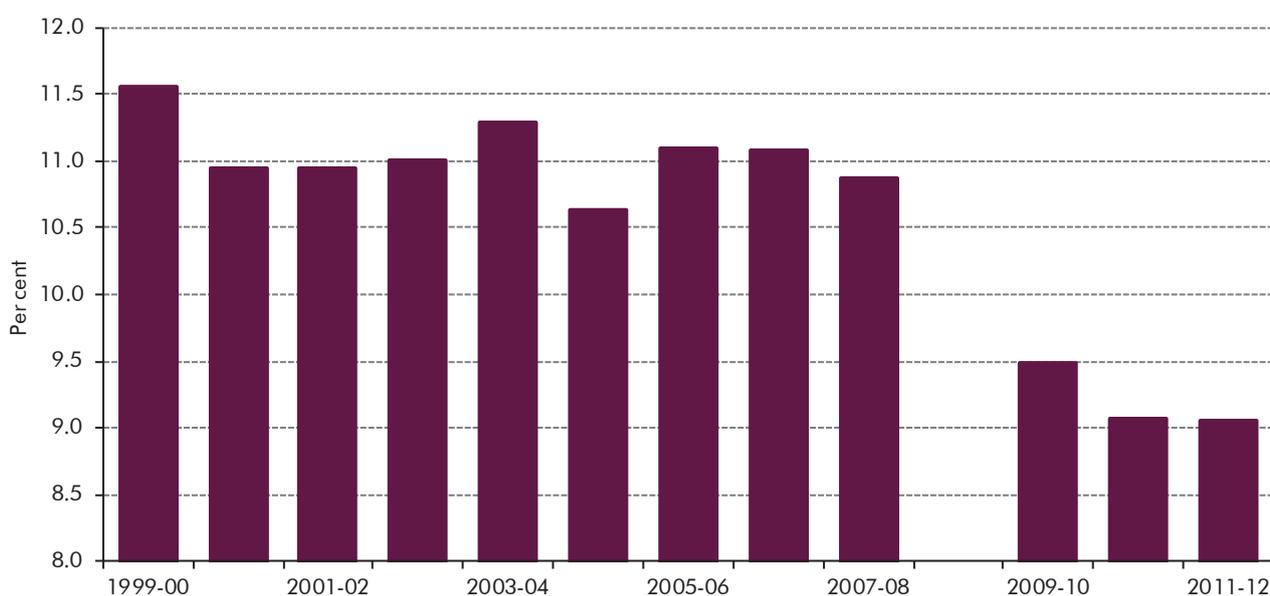
Chart A.24: Employee and self-employed income distribution (taxpayers only)



\*Distributions start at personal allowances for 2007-08 (£5225) and 2011-12 (£7475)  
Source: HMRC

**A.68** As described above, self-employment has risen in recent years and accounts for around 70 per cent of employment growth since the start of the recession. Despite this, as Chart A.25 shows, the share of self-employment income to total income has fallen from its pre-crisis level of around 11 per cent to around 9 per cent by 2011-12. This implies that recent rises in self-employment have on average been at the lower end of the income distribution. HMRC data indicate that the proportion of the self-employed reporting incomes below the personal allowance rose from 21 per cent in 2007-08 to 35 per cent in 2011-12. For those subject to income tax, a higher proportion of the self-employed declared lower incomes in 2011-12 than was the case in 2007-08. The lower incomes of the self-employed will also reduce the effective tax rate on these incomes. This is consistent with LFS data suggesting that around half of the gains in self-employment numbers over this period were part-time.

**Chart A.25: Self-employed income share, taxpayers only**



Data on 2008-09 are not currently available  
 Source: HMRC

**A.69** Our medium-term forecast in the March 2014 *EFO* assumed that growth in self-employed numbers would be in line with that in employee numbers. We also assumed that self-employed incomes would rise in line with the wages and salaries of employees. Naturally, these assumptions are subject to uncertainty. Different paths for the self-employed share of employment, or for self-employed incomes relative to employee wages and salaries, could lead to a higher or lower effective tax rate across total employment income and thus tax receipts.

## Conclusion

**A.70** Labour market trends are extremely important determinants of fiscal sustainability. One way to pay for rising age-related demands for health, long-term care and pensions spending would be for a greater proportion of the population to be in employment, earning income

and paying taxes. This annex has looked in more detail at employment and earnings trends that are relevant to understanding the sustainability of the public finances.

- A.71 In terms of employment, the UK has seen rising employment among women and older people, and rising self-employment as a share of the total. Employment among younger people has moved lower, largely because of greater participation in higher education. Trends in non-employment have been characterised by large cyclical fluctuations in unemployment and more persistent structural shifts in incapacity and disability that provide the backdrop to a number of significant welfare reforms currently in progress. We will return to these issues later in the year in our first *Welfare trends report*.
- A.72 In terms of earnings, recent years have seen an unprecedented period of falling real wages associated with the equally unprecedented weakness of productivity. A significant role has been played by self-employment, where much of the rise in the number of self-employed of recent years has been accounted for by people on relatively low incomes.
- A.73 An important consequence of these trends – rising employment and falling real wages – interacting with the rise in the income tax personal allowance in recent years, has been to reduce the effective tax rate on labour income. More people working means more personal allowances to offset against earnings before tax is paid. Our medium-term forecast is consistent with the effective tax rate rising from 2015-16 onwards, as we assume productivity and real wages will pick up slowly to reach historically normal rates over time. Our long-term projections are underpinned by an assumption that the effective tax rate on labour income trends very slowly lower due to demographic trends. If labour market trends led to a higher or lower path for the effective tax rate on labour income, the outlook for fiscal sustainability would be correspondingly better or worse.

## B Student loans

- B.1** The Government provides funds to support the provision of higher education both through grants – to universities for teaching and to students from low-income families to cover maintenance – and subsidised loans to students. We set out our latest long-term projection for net lending on student loans in Chapter 3. This annex summarises the changes since last year and highlights a number of uncertainties around that projection, focusing on the English student loans system in particular.
- B.2** To provide some context, we begin by summarising the latest policy position before describing the different accounting treatments for student loans and how the alternative measures to the National Accounts have changed over the recent past.

### Current policy

- B.3** Among the changes introduced in England in 2012 were:
- an increase in the maximum annual tuition fee to £9,000<sup>1</sup> from £3,375 under the previous system, with smaller changes to the structure of maintenance loans and grants. Part-time students are now eligible for tuition fee loans;
  - an increase in the earnings threshold above which loans begin to be repaid to £21,000. The threshold will now rise in line with earnings in future, with the proportion paid above the threshold remaining at 9 per cent;
  - changes to the interest rate charged, moving from RPI only to RPI plus 3 per cent during study and then RPI plus 0 to 3 per cent thereafter depending on the graduate's earnings;
  - an extension of the period over which loans are due, to 30 years post-graduation, rather than 25 years; and
  - cuts in teaching grants, with grants for most subjects abolished.
- B.4** Table B.1 provides a stylised illustration of what the changes have implied for the balance of contributions towards higher education funding for a representative student, comparing the current system against its predecessor and the 1998 system.

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<sup>1</sup> All higher education institutions can charge a basic fee of £6,000 for undergraduate courses. That cap rises to £9,000 if institutions sign access agreements approved by the Office for Fair Access (OFFA).

## Student loans

- B.5** It shows that over recent years successive governments have increased the fees that students can be charged for higher education, so shifting the funding of the system from taxpayer-funded direct grants to taxpayer-subsidised loans to students.<sup>2</sup>

**Table B.1: Balance of contributions to higher education funding**

	Unit cost per year (£, 2012 prices), unless otherwise stated			
	1998 system (2003 version)		2006 system (2009 version)	2012 system
<b>Taxpayer costs</b>		<b>5,800</b>	<b>8,500</b>	<b>7,800</b>
Teaching grant		3,700	3,700	600
Fee grant		700		
Maintenance grants			1,600	1,600
Maintenance loan - cash	4,400		4,100	4,000
Maintenance loan - RAB <sup>1</sup>	30%	1,300	42%	1,700
Fee loan - cash			3,700	8,200
Fee loan - RAB <sup>1</sup>			42%	1,500
				46%
				3,800
<b>Graduate contributions</b>		<b>3,100</b>	<b>4,500</b>	<b>6,600</b>
Maintenance repayment		3,100	2,400	2,100
Fee repayment			2,100	4,400
<i>The above sources enable</i>				
<b>Universities' income</b>		<b>5,200</b>	<b>7,000</b>	<b>8,400</b>
Teaching grant		3,700	3,700	600
Fees - public grant		700		
Fees - private, up-front		700		
Fees - via loans			3,700	8,200
Bursaries			-400	-400
<b>Student benefits</b>		<b>3,700</b>	<b>6,000</b>	<b>6,000</b>
Fee costs, up-front		-700		
Maintenance grants			1,600	1,600
Maintenance loans	4,400		4,100	4,000
Bursaries			400	400

Source: BIS analysis of SLC, HEFCE and OFFA data.

Components may not sum due to rounding.

<sup>1</sup>RAB: Resource accounting and budgeting charge, discussed further below.

- B.6** The Government also announced in Autumn Statement 2013 that it intends to sell the pre-2012 student loan book – which it expects will yield around £12 billion over a five year period from 2015-16 – and to remove the cap on student numbers attending higher-education institutions in England.
- B.7** Financial support differs by region. In relation to tuition fees: English and Northern Irish students can take out a loan regardless of where they study in the UK; Welsh students can claim a loan up to a certain level (£3,575 in 2013), with a grant covering any additional fee

<sup>2</sup> This makes a number of simplifying assumptions: it includes only those eligible for all forms of student financing (before means-testing); does not include smaller elements of funding, such as childcare grants; and otherwise assumes full take-up of loans. To control for cohort effects across periods, the same economic assumptions have been applied to all three versions, using the 2012 cohort.

costs; Scottish students do not pay if they study in Scotland, and are eligible for a loan if they study elsewhere in the UK; and students from the rest of the EU are treated as if they were from the region in which they study (for example, EU students pay no tuition fees in Scotland). Maintenance loan support also varies (students from the rest of the EU do not receive maintenance support).

## Accounting treatments

**B.8** There are a number of flows potentially involved in the student loans process. In particular:

- cash spending on new loans: simply the cash that the Government lends to students to cover tuition fees and maintenance;
- cash repayments: payments made by students over time to cover the initial loan and interest;
- interest on loans: the income-contingent interest that students are required to pay on the loans;
- write-offs: the amount written-off under particular circumstances – death or changes in disability status – or at a pre-arranged point in time;
- cash disposals: amounts raised, for example, if parts of the student loan book are sold to the private sector; and
- government debt interest: the costs to the Exchequer of financing the net lending – issuance less repayments – to students (also taking into account proceeds from loan book sales).

**B.9** The treatment of these flows differs within the National Accounts, Whole of Government Accounts (WGA) and the Treasury’s budgetary framework. Table B.2 compares the three approaches.

**Table B.2: Comparison of accounting treatments**

Flow	Has an impact on:		
	Net debt and net borrowing (National Accounts)	Net liabilities and deficit (Whole of Government Accounts)	RAB charge (Resource budgeting)
Cash spending on new loans	Net debt; not net borrowing	Neither initially, but book is amortised (affects both)	RAB charge
Cash repayments			RAB charge includes projected net present values
Interest on loans	Net borrowing; not net debt	Both	
Write-offs		Both upfront (impairment)	
Disposals	Net debt; not net borrowing	Potentially both	Not RAB charge
Government debt interest	Both	Both	Estimate implicitly included

## Student loans

- B.10** Some of these flows are treated differently in the WGA and the National Accounts measures of debt. There are two key distinctions:
- net debt in the National Accounts only nets off liquid assets, and not illiquid assets such as the student loan book; and
  - WGA includes impairments when loans are first issued, and updates estimates over time, whereas the National Accounts only include write-offs when they crystallise.

### Student loans in the National Accounts

- B.11** Net debt in the National Accounts is affected by the cash elements only. It rises with the new issuance of loans and the debt interest paid on the gilts to finance the lending, and falls when cash repayments are made or part of the book is sold (which essentially brings forward the repayments net of write-offs if fairly priced). It is only affected by interest on the loans to the extent that it increases the total amount students repay, and by write-offs to the extent that they imply permanently higher debt interest.
- B.12** Net borrowing is an accrued concept, so is not directly affected by the cash transfers, but does reflect their permanent effects. As each year progresses, the interest owed to the Government on the loan book rises, as does the interest the Government must pay on its own debt, and both affect net borrowing. Write-offs only affect net borrowing when they crystallise.

### Student loans in the Whole of Government Accounts

- B.13** There are two key distinctions between the National Accounts and WGA:
- net debt in the National Accounts only nets off liquid assets, and not illiquid assets such as the student loan book. These are recognised as assets in the WGA measures of gross assets and net liabilities, and are amortised. In the first instance, issuing new loans or receiving repayments affects both the asset (value of student loan book) and liability (government debt) by the same amounts. But this would only be the case if the loans were expected to be repaid in full (see below). Loan book sales only affect WGA net liabilities to the extent that the proceeds are higher or lower than the value on the balance sheet; and
  - there is a difference in timing: because loans are not expected to be repaid in full, WGA includes impairments when loans are first issued – and updates estimates over time – whereas the National Accounts only include write-offs once confirmed.
- B.14** The 2012-13 WGA balance sheet was discussed in Chapter 2, including a split of student loan assets by nation. Table B.3 summarises the value of English student loans on the Department for Business, Innovation and Skill's (BIS's) balance sheet in 2012-13 and 2013-14. It shows that for 2013-14:

- new loans issued and repayments on previous loans totalled £9.0 billion and £1.5 billion respectively. There will have been offsetting changes in the stock of government debt, so these do not affect the net liability position;
- selling the mortgage-style loan book reduced the value of assets by around £0.1 billion, but again, there is an offsetting effect on government debt. The proceeds were £12 million higher than on the balance sheet, so there was a small gain on disposal;
- the loan book is discounted each year to a new net present value, using RPI plus 2.2 per cent as the discount rate. This amortisation exceeded the interest accrued on the loans by around £0.6 billion; and
- additional write-off impairments reduced the value of the loan book by £4.2 billion. Half of this amount reflected new estimates of the value of the existing loan book – mainly due to changes in the repayments model discussed further below – and the other half estimated impairments on new loans issued during the year.

Table B.3: Changes to English student loan assets

	£ billion	
	2012-13	2013-14
<b>Student loan assets</b>		
Opening balance	28.1	30.7
Closing balance	30.7	33.3
<b>Change</b>	<b>2.6</b>	<b>2.6</b>
<i>of which:</i>		
New loans issued	7.1	9.0
Repayments	-1.6	-1.5
Disposals	0.0	-0.1
Amortisation	-1.5	-1.9
Interest	1.0	1.3
Impairments	-2.4	-4.2

## Student loans in the budgeting framework

**B.15** Budgets for BIS are set by the Treasury using a different concept for spending control – the resource and budgeting (RAB) charge. The RAB charge is an estimate of the implicit subsidy associated with issuing student loans. This implicit subsidy takes two forms:

- a write-off subsidy: since some students will not fully repay their loans before they are written off after 30 years, and some loans will be written-off earlier (for example due to deaths); and
- an interest rate subsidy: since the interest rate charged on the loan may be less than the government pays on its own debt issued to finance the loans.

## Student loans

- B.16** The RAB charge is usually quoted as a share of the loans issued. For example, a RAB charge of 45 per cent – similar to BIS’s latest estimate for post-2012 loans – would suggest that the Government would ultimately, in net present value terms, only receive 55 per cent of the original cash issued back.
- B.17** Estimates for the RAB charge use RPI plus 2.2 per cent<sup>3</sup> as a proxy for the interest on government debt, and are very sensitive to this assumption; a 1 percentage point reduction in the discount rate would reduce estimates of the RAB charge by something of the order of 10 percentage points. No specific gilts are issued to finance student loans – the Debt Management Office (DMO) finances the total net cash requirement in accordance with the Government’s debt management policy objective – but the Exchequer is currently servicing its debt at lower rates of interest than RPI plus 2.2 per cent on average.
- B.18** RAB charge estimates have however changed over the recent past for other reasons, in particular expectations for the future stream of repayments have fallen. BIS estimates for the charge on loans issued under the current system have increased from 32 per cent in the June 2011 impact assessment to around 40 per cent by the end of 2013 and around 45 per cent today. These changes mainly reflect updated assessments of the economic outlook, in particular lower earnings growth (linked with the much weaker-than-expected growth in productivity).
- B.19** They also reflect changes to the modelling of repayments. The latest model now makes greater use of Student Loans Company data, in addition to survey data, and also makes greater use of historic earnings data to project forward individuals’ future earnings paths. These changes have widened the projected earnings distribution over time, which, since payments are only due over a fixed threshold, has reduced expectations for future repayments.<sup>4</sup>
- B.20** These updates also affect the charge on loans already issued under the previous system, which in addition are sensitive to expectations of Bank Rate (this currently affects the interest charged on these loans). For example, the illustrative numbers in Table B.1 would suggest a charge on loans issued in 2012-13 under the previous system of around 40 per cent. The composition of the charge between write-off and interest subsidies has changed under the new system, with a larger write-off subsidy but a relatively smaller interest rate subsidy.
- B.21** As an attempt to recognise future costs upfront, the RAB charge is closer in spirit to WGA than the National Accounts. Although BIS sets aside part of its budget to cover the RAB charge, given the way the National Accounts are measured this does not directly affect our fiscal forecast. The other parts of BIS’s budget largely do affect our spending forecast, so if the RAB charge is increased, and this goes on to be offset elsewhere, then our borrowing forecast would be reduced in the first instance. Only over time would the additional funding pressure related to student loans affect our fiscal projection.

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<sup>3</sup> The addition to RPI was reduced from 6.0 per cent to 3.5 per cent in 2003 and has been 2.2 per cent since 2005-06.

<sup>4</sup> A brief guide to the new model is available on BIS’s website.

**B.22** To limit potential volatility within BIS's budget, the budgeting framework since 2013-14 now only demands that BIS covers any shocks to its departmental budget over 30 years, so only one thirtieth will need to be set aside immediately, reducing the likelihood of knock-on effects to other parts of its spending, and thus our fiscal forecast, in the short term.

## Central projections

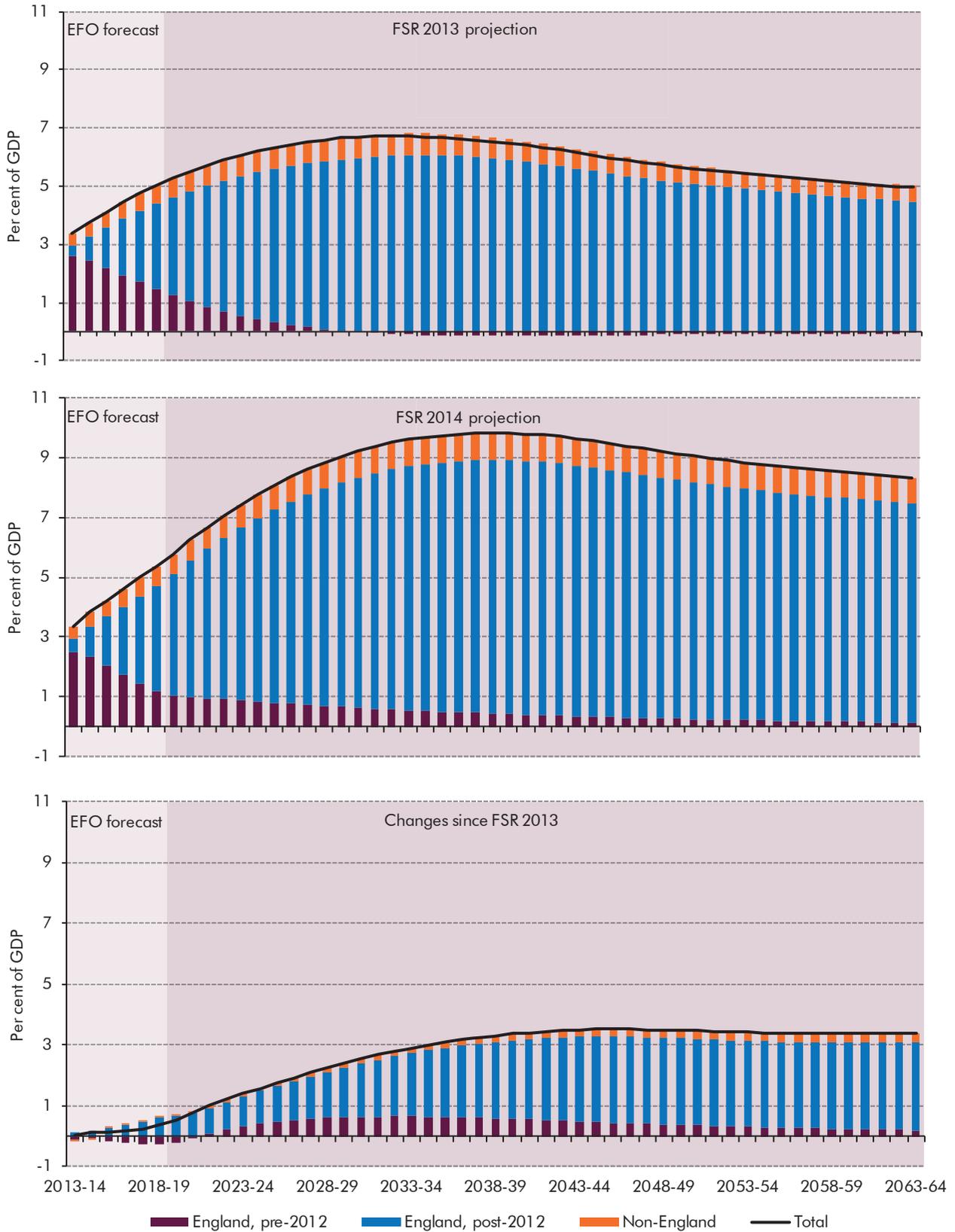
**B.23** Our projections are produced by BIS, based on our long-term economic assumptions and a number of other stylised assumptions. Chart B.1 shows last year's central projection. At the time, we projected that net lending on student loans would add 5.0 per cent of GDP to net debt by 2018-19, before peaking at around 6.7 per cent of GDP in the early 2030s and then returning to 5.0 per cent of GDP in the early 2060s. These figures reflected:

- a declining share relating to the pre-2012 English loan book, as the book had closed but repayments continued to come through. In cash terms, repayments were slightly bigger than the initial amounts issued, as graduates also repaid some interest. But there were still implied write-off and interest subsidies as not all interest was received. And the government would also pay additional debt interest, which is not shown in the chart;
- increasing amounts from the post-2012 English loan book until the mid-2030s, before a gradual decline as additional cohorts begin to make repayments. The peak impact from these loans in particular was 6.1 per cent of GDP, falling to 4.5 per cent of GDP by 2063-64; and
- small amounts relating to non-English loans. This projection was not produced bottom-up, but was instead assumed to follow a similar path to English loans.

**B.24** Chart B.1 also shows our latest projection and the changes since last year. We now project that the direct flows will add 5.4 per cent of GDP to net debt in 2018-19, rising to 9.8 per cent of GDP by the mid-2030s, and then falling to 8.3 per cent of GDP in 2063-64.

Student loans

Chart B.1: FSR 2013, latest and changes in the projections for the additions to net debt from student loans



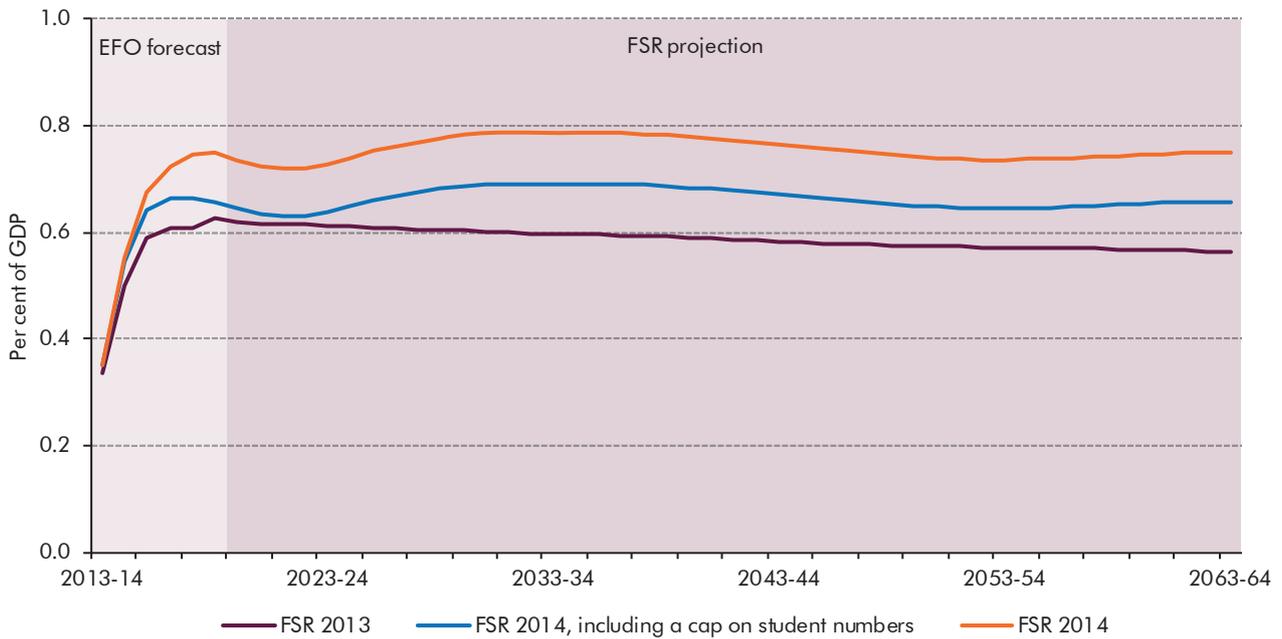
Source: OBR

- B.25** Since last year's report, the Government has announced that it intends to sell the pre-2012 student loan book and to remove the cap on student numbers attending higher-education institutions. 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 taken the neutral assumption that sales will be evenly spread across the five years beginning 2015-16, implying that no repayments will be received by the Exchequer beyond 2019-20.<sup>5</sup>
- B.26** Assuming the assets are sold at fair value, the expected return to the Government at the point of sale would be zero. All else equal, we would expect to see small reductions in net debt in the near term and small increases in the longer term, since the cash value of the repayments will eventually exceed the cash payments received in advance (and the difference in the net present value implied by the flows in the chart offset by debt interest payments, which are not shown in the chart). However, updates to the modelling of repayments described above imply the fair value of the loan book is now lower than projected last year. So changes reflect both this lower fair value and whether or not the loans are being sold at fair value.
- B.27** In effect, the sale crystallises losses on the loans: 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.
- B.28** Changes relating to the post-2012 English loan book are much larger. Our projection for non-English loans is based on our latest medium-term forecasts and the longer-term projection for England, both of which have led to small increases over time.
- B.29** Removing the cap on student numbers raises cash spending under the current system. Chart B.2 shows that we now project new loans issued by BIS to settle at around 0.7 per cent of GDP in the long term, around 0.2 per cent of GDP higher than projected last year. Around half of the change reflects the removal of the cap, with the remainder mainly due to higher-than-expected take-up of loans by students in 2012-13, which we assume are representative of future cohorts.

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<sup>5</sup> There may be some loans that do not meet the eligibility criteria and therefore remain in Government ownership.

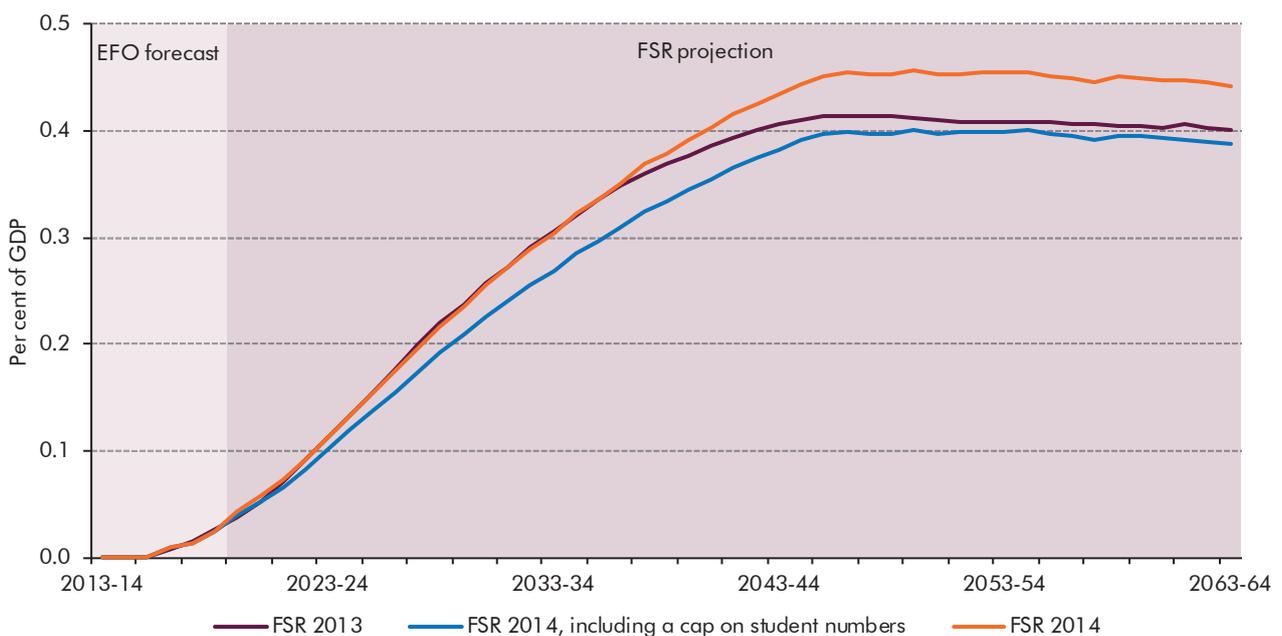
Chart B.2: Projected cash spending on English post-2012 loans



Source: OBR

**B.30** Our repayments projection for the post-2012 loan book is shown in Chart B.3. Repayments are projected to rise gradually to around 0.5 per cent of GDP in the mid-2040s, as the first group of students under the new system approach the end of their 30-year repayment cycle. Our projection is higher than last year, but by less than might be expected given the greater number of students making repayments, as repayments per student are now expected to be lower over time.

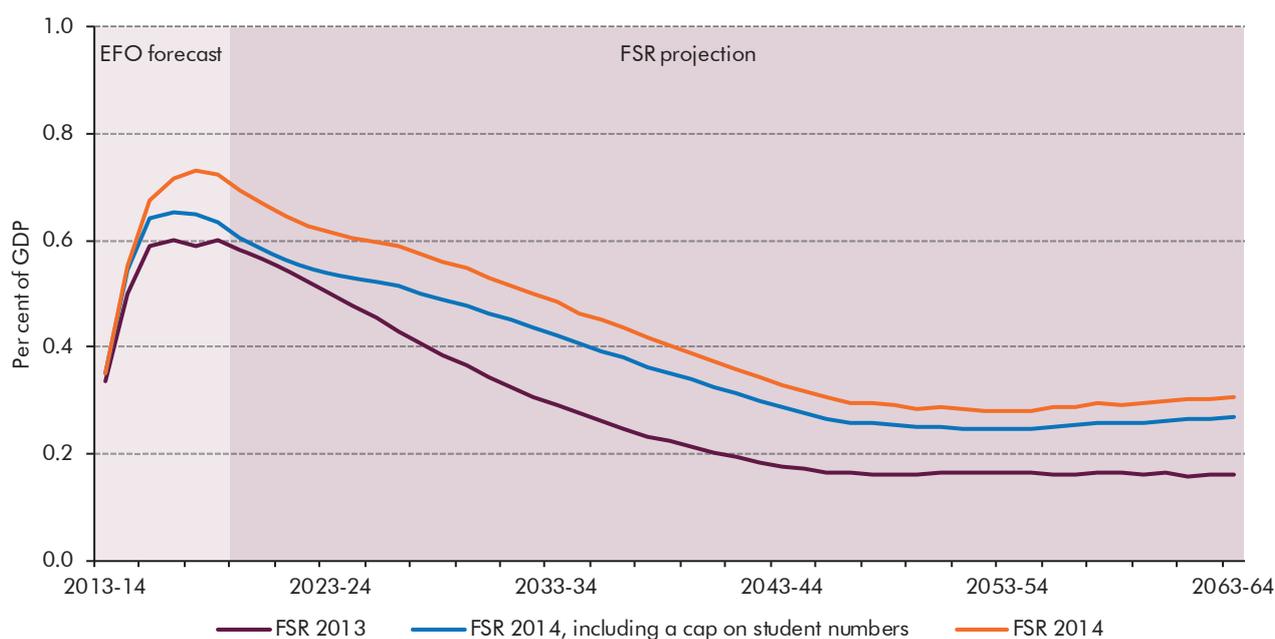
Chart B.3: Projected cash repayments on English post-2012 loans



Source: OBR

- B.31** Chart B.4 brings both cash spending and repayments together to show what our latest projections imply for net lending in any given year. It shows that changes to our underlying projections – increasing the average amount borrowed per student, but reducing the proportion that is eventually repaid – explain the majority of the change in our projection for net lending since last year, with the removal of the student cap also adding to the total. Once the system matures, we project annual net lending will settle at around 0.3 per cent of GDP a year.

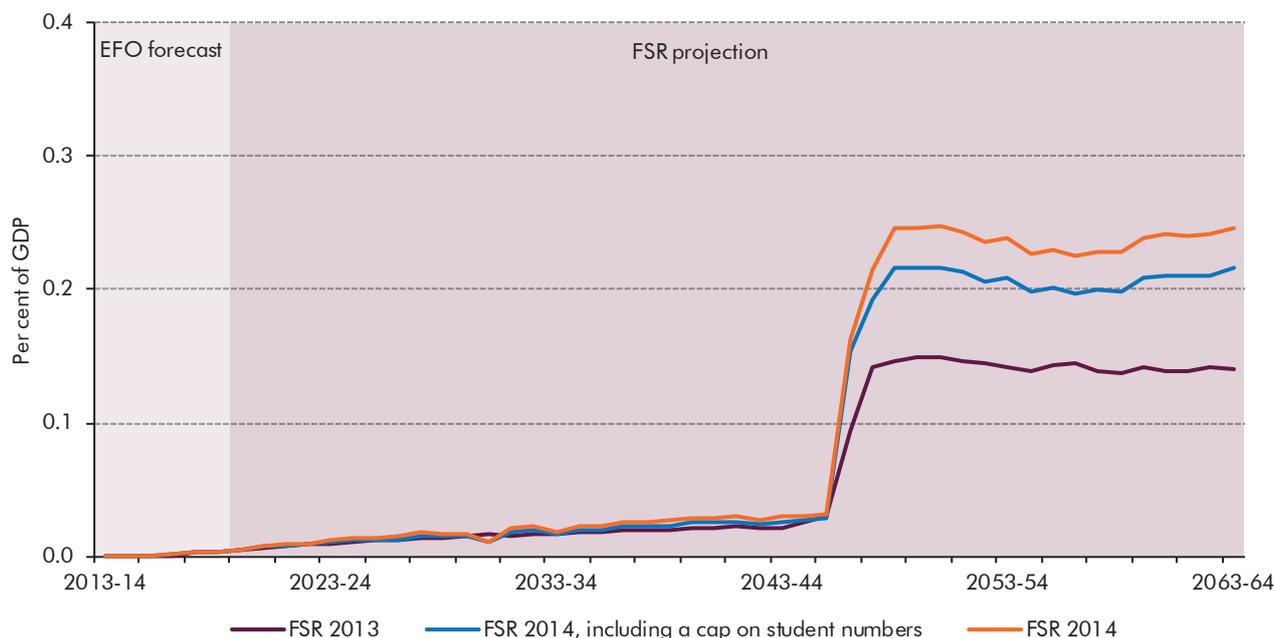
**Chart B.4: Projected net lending on English post-2012 loans**



Source: OBR

- B.32** Chart B.5 shows our implied projection for future write-offs. These will affect net borrowing as they are crystallised, but will only affect net debt indirectly, due to the absence of repayments thereafter. We project only small amounts of write-offs up to 2046-47, the year at which the first cohort of graduates under the new system will have any outstanding loans written-off, and that in the long term write-offs will amount to 0.2 per cent of GDP a year, equivalent to around 3½ per cent of the carrying value of the loans.

Chart B.5: Projected write-offs on English post-2012 loans



Source: OBR

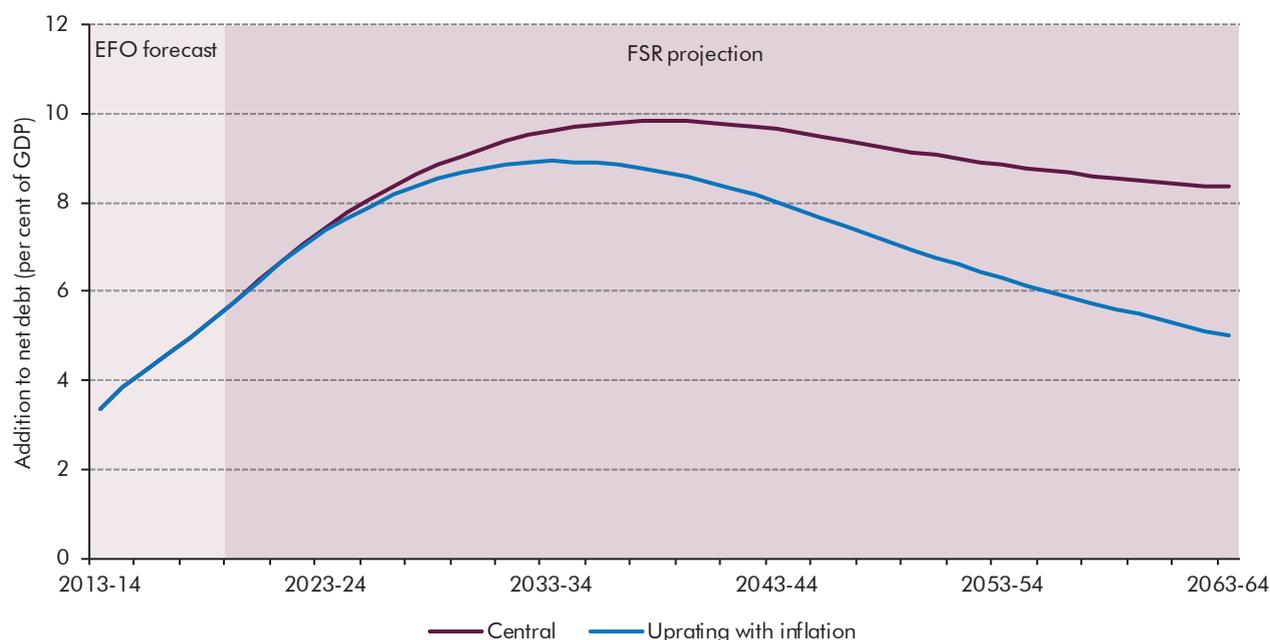
## Sensitivities

**B.33** There are many uncertainties around our central projection. Here we highlight three: future fees; student numbers; and the volatility of incomes across future graduates.

### Uprating of fees

**B.34** Our central projection assumes that the average tuition fee (and maintenance loan) rises in line with earnings, rather than being uprated with inflation, as in our medium-term forecast. Rolling that assumption forward into the long term would imply university income would steadily diminish relative to the size of the economy. Chart B.6 shows that if fees and maintenance loans continued to rise in line with inflation, the impact on net debt from student loans would peak at 8.9 per cent of GDP and tail off more quickly than in our central projection. In 2063-64 they would add 5.0 per cent of GDP to net debt rather than the central projection of 8.3 per cent of GDP.

Chart B.6: Sensitivity of our student loans projection to uprating with inflation

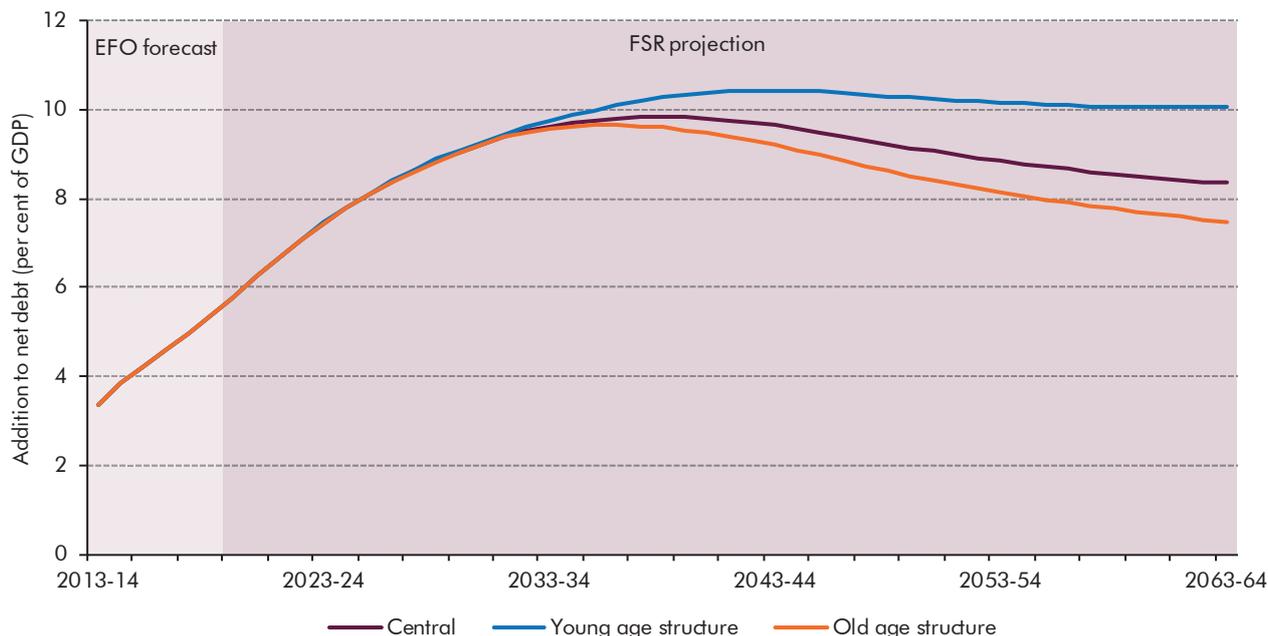


Source: OBR

## Student numbers

- B.35** The Treasury estimate that removing the cap on student numbers will lead to an additional 60,000 entrants into higher education institutions, but there is some uncertainty as to what the level of additional demand will be, and whether it would trend in a particular way over time.
- B.36** Our previous projections assumed that student numbers would remain flat over the period, but we now assume that, conditional on age, the likelihood of a student attending a higher education institution remains constant in the long term. Linking the projection to demographics implies only modest changes in the number of students over time. Chart B.7 shows our long-term projections if we maintain that assumption but apply it to the ONS's 'young age structure' and 'old age structure' population variants, where the number of teenagers rises or falls more significantly as a share of the population.
- B.37** Under the 'young age structure' variant, lending on students loans continues to add to debt as a share of GDP into the mid-2040s, with the trajectory only gradually declining thereafter, and the addition to net debt remains at around 10 per cent of GDP in 2063-64. Under the 'old age structure' the impact declines more quickly over time. Although motivated by changes in demographics, the variants give an indication of the impact if the proportion of students in given cohorts ended up being higher.

Chart B.7: Sensitivity of our student loans projection to demographic assumptions

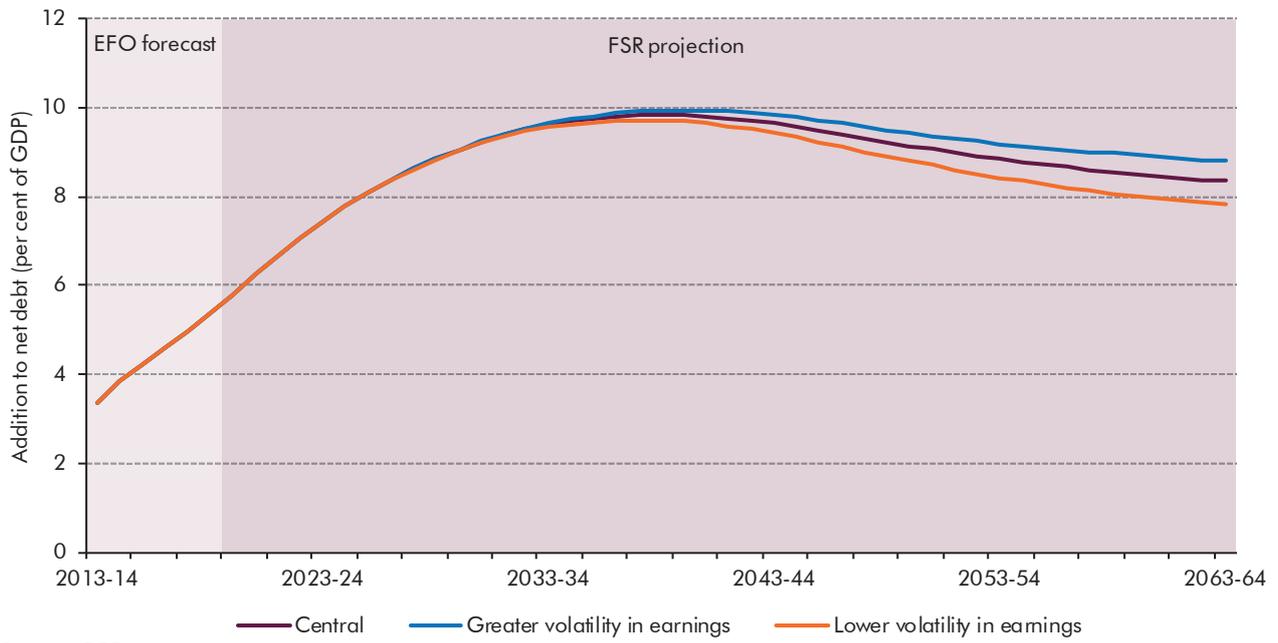


Source: OBR

## Earnings volatility

- B.38** Our projection assumes that fees, loans and thresholds all increase in line with earnings in the long term. This tempers the sensitivity of our projection to changes in the absolute level of earnings, but the distribution of earnings also matters, given repayments are only due if incomes are above the repayment threshold and the interest charge is linked to a graduate’s earnings.
- B.39** Chart B.8 shows the sensitivity of our projection to changes in the volatility of earnings. The variants assume that earnings growth rates in the top and bottom thirds of the population either converge or diverge each year. The repayments model used to produce our projection is stochastic, so the same graduate could be in a particular third during one period and the other third in the following. The earnings distribution widens or narrows over time due to some persistence in earnings, but only gradually. The shocks imposed on our central repayment projection is roughly the same as the change in our underlying projection since last year, but without a change in cash spending the impact on net debt would be relatively small.

Chart B.8: Sensitivity of our student loans projection to volatility in earnings



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