

Office for  
**Budget  
Responsibility**

**Forecast evaluation report**

October 2017

Forecast evaluation report 2017

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# **Office for Budget Responsibility**

## Forecast evaluation report

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October 2017



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# Foreword

The Office for Budget Responsibility (OBR) was created in 2010 to provide independent and authoritative analysis of the UK public finances. Twice a year – at the time of each Budget and, until 2016, each Autumn Statement – we publish a set of forecasts for the economy and the public finances over the coming five years in our *Economic and fiscal outlook (EFO)*. We use these forecasts to assess the Government's progress against the fiscal targets that it has set itself.

In each *EFO*, we stress the uncertainty that lies around all such forecasts. We compare our central forecasts to those of other forecasters. We point out the confidence that should be placed in our central forecast given the accuracy of past official forecasts. We use sensitivity and scenario analysis to show how the public finances could be affected by alternative economic outcomes. And we highlight uncertainties in how the public finances will evolve, even if one were to know with confidence how the economy was going to behave – for example, because of uncertain estimates of the cost or yield associated with new policy measures.

Notwithstanding these uncertainties – and the fact that no one should expect any central economic or fiscal forecast to be met in its entirety – we believe that it is important to spell out our forecast in considerable quantitative detail and then to examine and explain after the event how it compares to subsequent outturn data. That is what we endeavour to do in this report.

We believe that it is important to publish the detail of our forecasts for two main reasons:

- The first is **transparency and accountability**: the whole rationale for contracting out the official fiscal forecast to an independent body is to reassure people that it reflects dispassionate professional judgement rather than politically motivated wishful thinking – even if people disagree with the particular conclusions we have reached. The best way to do that is to 'show our working' as clearly as we can.
- The second is **self-discipline**: the knowledge that you are going to have to justify your forecast in detail forces you to make only those judgements you are willing to defend. You cannot hide them in the knowledge that no one will ever know.

Assessing the performance of our forecasts after the event is also important for transparency and accountability – and for helping users to understand how they are made and revised. Identifying and explaining forecast differences also helps improve our understanding of the way in which the economy and public finances behave, and hopefully allows us to improve our judgements and forecast techniques for the future. We have taken that a step further this year through a systematic review of key models that are used to help us construct individual lines of our fiscal forecasts. We have also published a new briefing paper that describes how we evaluate our forecasts.

## Foreword

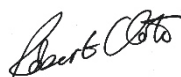
We describe the arithmetic divergence between our central forecasts and the subsequent outturns as ‘differences’ rather than ‘errors’, because in many cases it would have been impossible to avoid them given the information available when the forecast was made. Where we do find genuine errors, which could have been corrected if we had spotted them, they are described as such. Errors of this sort are inevitable from time to time in a highly disaggregated forecasting exercise like ours.

In judging our own performance – and in assessing the relative performance of different forecasters – it is important to remember that the current outturn data represent a relatively early draft of economic history. The stories we have told in previous reports look different after subsequent data revisions. So what appear to have been accurate or inaccurate forecasts today may look very different in the wake of inevitable and often large statistical revisions. This was certainly the experience of the recession and recovery of the 1990s and there continue to be significant revisions to the history of the late 2000s recession and its aftermath.

We have continued the approach used in past reports of trying to understand the underlying economic forces that have led outturns to diverge from our central forecast. But, as in previous reports and the Treasury’s *End of year fiscal reports* that preceded them, we also present the detailed decomposition of specific fiscal year forecasts. As with all our reports, we would be very grateful for feedback on its content and for suggestions to improve future reports.

The forecasts we publish represent the collective view of the three independent members of the OBR’s Budget Responsibility Committee (BRC). Our economy forecast is produced entirely by OBR staff working with the BRC. For the fiscal forecast, given its highly disaggregated nature, we also draw heavily on the help and expertise of officials from across Government, most notably in HM Revenue and Customs and the Department for Work and Pensions. We are very grateful for this work and for the analysis that they have contributed to the production of this report. While recognising these valuable contributions, we also stress that the BRC takes full responsibility for the judgements underpinning the forecasts and for the performance of them presented in this report.

At the Treasury’s written request, and as provided for in the Memorandum of Understanding between us, we provided the Chancellor and an agreed list of his special advisers and officials with a near-final draft of the *Forecast evaluation report* on 6 October. We also provided a full and final copy 24 hours in advance of publication.



Robert Chote



Sir Charles Bean



Graham Parker CBE

The Budget Responsibility Committee

# 1 Executive summary

- 1.1 Twice a year at the OBR, we provide a detailed central forecast for the economy and the public finances. These forecasts provide a transparent benchmark against which to judge the significance of new economic and fiscal data and against which to estimate and explain the likely impact of policy decisions. But since the future can never be known with precision, all such ‘point’ forecasts are necessarily surrounded by uncertainty – the likelihood that any given forecast will turn out to be accurate in all respects is essentially negligible.
- 1.2 We stress these uncertainties in every *Economic and fiscal outlook (EFO)* we publish. We present probability distributions around our central forecasts based on past forecast performance, sensitivity analysis of key assumptions and assessments of the fiscal implications of different economic scenarios. And once a year, in our *Forecast evaluation report (FER)*, we compare the latest outturn data to our earlier central forecasts and seek to explain the inevitable differences. This year we have stepped up our analysis of the risks around our forecasts – and around long-term fiscal sustainability more generally – with the publication of our first *Fiscal risks report*.
- 1.3 Throughout this report, we describe the arithmetic divergence between the central forecasts and the subsequent outturns as ‘differences’ rather than ‘errors’, because in many cases it would have been impossible to avoid them given the information available when the forecast was made. Where we do find genuine errors, which could have been corrected if we had spotted them, they are described as such. Errors of this sort are inevitable from time to time in a highly disaggregated forecasting exercise such as ours.
- 1.4 The backdrop to this report is:
- a **real economy** in which growth has slowed steadily over the past three years, with growth over the past year weakening as household real incomes and spending were squeezed by higher inflation following the fall in the pound after the EU referendum;
  - a **labour market** that has continued to exhibit strong growth in employment, but weak growth in earnings and productivity; and
  - a falling **budget deficit** and a **public debt to GDP ratio** that has broadly stabilised once allowance is made for the impact of the monetary policy easing following the referendum, which has added to the headline public sector net debt measure.
- 1.5 This is our first *FER* to consider forecasts relative to outturn data that embody the initial response of the economy to the Brexit vote and the start of exit negotiations. At this early stage, it appears that the impact of a weaker pound on households’ real incomes and spending through higher inflation has been broadly in line with our post-referendum



forecasts. Business investment data have been revised significantly – as is often the case – and now suggest that it slowed more sharply than previously thought in 2015 but has grown at a moderate pace since then. There appears to have been a modest boost to net trade from sterling’s depreciation. Net inward migration has slowed, probably partly as the fall in the pound reduced the value of UK wages in potential immigrants’ home currencies.

## What questions do we seek to answer in this report?

- 1.6 The focus of this year’s report is an evaluation of our one- and two-year ahead forecasts for 2016-17. This means looking at our March 2015 forecast – the last under the Coalition Government – and our March 2016 forecast – our last before the EU referendum. In terms of the economy, we explore why real GDP growth fell a little short of both forecasts and what we can learn from the composition of those differences – including what we can learn about the initial effects of the referendum. In terms of the public finances, we ask why, on a like-for-like basis, our March 2015 forecast proved to be optimistic – including the effect of the higher public spending announced after the 2015 General Election – and why our March 2016 forecast proved to be slightly pessimistic – despite the weaker real economy.
- 1.7 In Chapter 2, we also take a deeper look at trends in productivity growth and the labour market. Once again we are faced with productivity performing more weakly than forecast, but employment and the average number of hours worked surprising to the upside. We also draw some lessons for the judgement about the future path of potential output that we will need to make in our forthcoming *EFO*, to be published alongside the Chancellor’s Autumn Budget on 22 November.

## Explaining 2016-17 forecast differences

- 1.8 Real GDP growth in the period up to mid-2017 was weaker than predicted in both our March 2015 and March 2016 forecasts, but nominal GDP growth – which is the more important driver of the public finances – fell short of our March 2015 forecast by a smaller margin while it actually exceeded our March 2016 forecast. The composition of GDP is also fiscally important because of the variation in which different elements are taxed:
- **In expenditure terms**, the shortfall in real GDP growth was dominated by the weakness in business investment, which is fiscally favourable in the short term because it boosts corporation tax receipts. But over longer horizons, weak business investment is fiscally damaging since it reduces the productive capacity of the economy as a whole. Relative to our March 2016 forecast, while consumer spending was a little weaker than expected in real terms, that shortfall was more than offset by higher-than-expected inflation to leave nominal spending – which drives tax receipts – higher than forecast.
  - **In income terms**, the nominal differences relative to both forecasts were broadly based across the main components. Relative to both forecasts, average earnings growth was weaker than expected while employment growth was stronger. Profits growth was stronger than in both our March 2015 and March 2016 forecasts.

- 1.9 On a broadly like-for-like basis – abstracting from the effect of classification changes – our March 2015 forecast was too optimistic while our March 2016 forecast was too pessimistic:
- **Relative to our March 2015 forecast**, borrowing was £10.9 billion higher than expected, with much higher-than-expected spending more than offsetting higher-than-expected receipts. For spending, this was largely the consequence of significant increases in departmental spending announced in the July 2015 Budget, which were topped up further in the Spending Review in November 2015. Local authorities also spent more than we forecast, drawing more than expected on their reserves and prudential borrowing to do so. Receipts were boosted by policy measures, including raising rates of insurance premium tax and dividend tax, and the introduction of a stamp duty surcharge on purchases of second homes and buy-to-lets. Corporation tax receipts were also stronger than expected, but self-assessment income tax receipts were significantly weaker.
  - **Relative to our March 2016 forecast**, borrowing was £2.8 billion lower than expected, more than explained by higher-than-expected receipts. Unexpected economic developments boosted receipts, as stronger profits and higher employment more than offset the effect of weak average earnings growth. Other receipts surprises were positive too, including a variety of factors boosting onshore corporation tax receipts, and smaller upside surprises in VAT and capital gains tax receipts. Spending was higher than expected, with higher local authority spending and the effect of higher RPI inflation on debt interest both raising spending compared with our forecast. A larger-than-expected departmental underspend and differences in the timing of EU payments in calendar year 2017 were the largest factors acting in the opposite direction.

## 2016-17 data revisions and 2017-18 year-to-date outturns

- 1.10 Our *FER* analysis is carried out on the basis of the September vintage of the Office for National Statistics (ONS) public finances data for 2016-17. One striking feature is the extent to which it has been revised since the ONS published its initial estimate in April. The latest estimate of the deficit is £7.0 billion lower than the initial one, with classification and methodology changes accounting for £1.3 billion of that and the remainder attributable to a combination of higher central government receipts (£4.9 billion), lower central government spending (£0.6 billion) and lower local authority borrowing (£0.2 billion).
- 1.11 On the latest estimate, borrowing in the first five months of 2017-18 was broadly flat relative to the same period in 2016-17. Our March 2017 forecast predicted that borrowing in the full year would be £58.3 billion, a £6.5 billion rise relative to our March estimate of 2016-17 borrowing but a £13.2 billion rise relative to the latest ONS estimate, following the large downward revisions.
- 1.12 Our March forecast estimated that self-assessment income tax receipts would fall £3.9 billion on the previous year as a result of unwinding of the dividend income shifting that had boosted 2016-17 receipts. As self-assessment is paid near the end of the fiscal year, this expected fall will not have affected the latest data. But some of the overall downward

## Executive summary

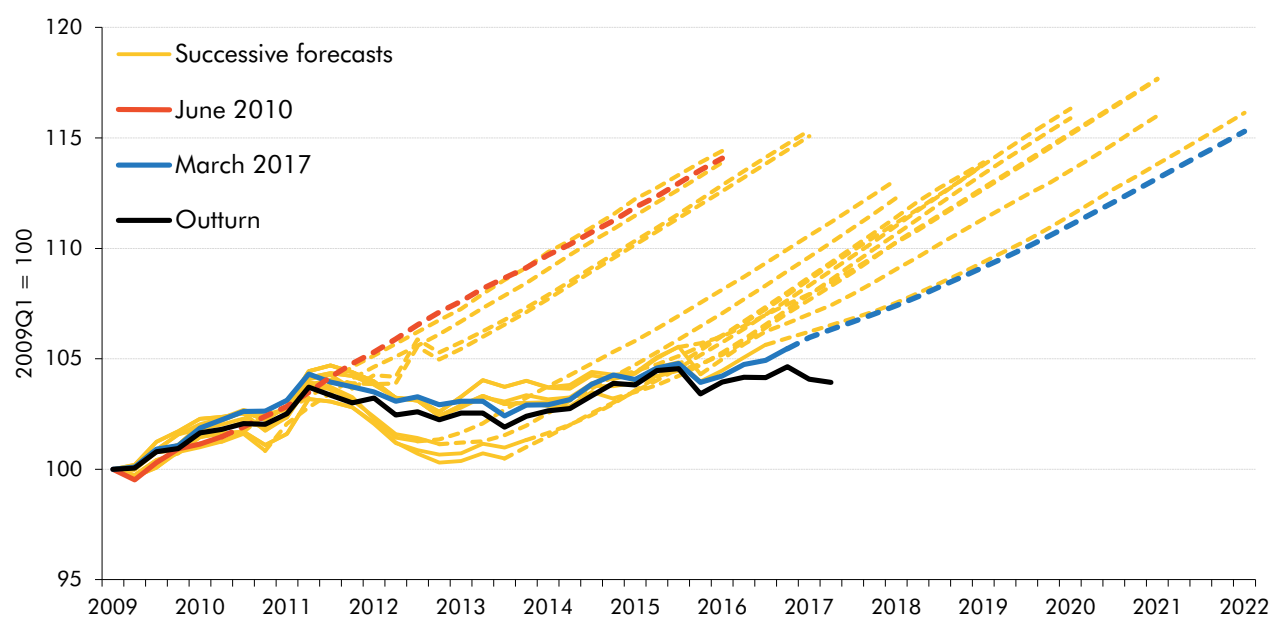
revision to the 2016-17 deficit over the past five months would, all else equal, be expected to result in lower borrowing this year than forecast in March. The judgements we make about in-year receipts and spending are likely to be an important factor in our forthcoming November forecast.

## Productivity growth and the labour market

### Productivity growth

1.13 One recurring theme in past *FERs* has been productivity falling short of our forecasts (Chart 1.1) while employment and average hours worked have exceeded them. That pattern is repeated for both forecasts evaluated in this report and, based on revised GDP data and outturns in the first half of 2017, will be repeated again for our March 2017 forecast.

Chart 1.1: Successive OBR productivity forecasts (output per hour)



Note: Solid lines represent the outturn data that underpinned the forecasts at the time (the dashed lines).  
Source: ONS, OBR

1.14 Our rationale for basing successive forecasts on an assumed pick-up in prospective productivity growth has been that the post-crisis period of weakness was likely to reflect a combination of temporary, albeit persistent, influences. And as those factors waned, so it seemed likely that productivity growth would return towards its long-run historical average.

1.15 The hiatus in productivity growth has now lasted for almost a decade, and some of the earlier explanations for its weakness seem less applicable today. For example, in the immediate post-crisis period, labour hoarding in the face of temporarily weak demand was a plausible hypothesis, but that became less appropriate once firms began hiring again. Subsequently, we placed more weight on the hypothesis that an impaired banking system had slowed the reallocation of resources to more productive uses. But the banking system is now much better capitalised and more robust than it was in the immediate aftermath of the

crisis, so this explanation no longer looks as relevant as it once did. More recently, as the labour market has tightened, with the unemployment rate now at its lowest since the early 1970s, upward pressure on wage growth was expected to encourage firms to economise on labour and to push through productivity improvements, but that has yet to happen. This limited response of wage growth to emerging labour market tightness is an international phenomenon that the IMF has addressed in its October 2017 *World Economic Outlook*.

- 1.16 Some other explanations remain relevant. For example, business investment has been very weak since the crisis. Business investment today is just 5 per cent above its pre-crisis peak almost a decade ago; in contrast, a decade after the 1980s and 1990s recessions, investment was 63 and 30 per cent higher than the pre-recession peaks respectively. This sustained weakness in investment will have limited the contribution to labour productivity growth from capital deepening.
- 1.17 The abnormally low level of interest rates could also be weighing on productivity growth by allowing weak and highly indebted firms to survive for longer than they normally would, by alleviating the burden of servicing their debts. This would lower productivity both through a ‘batting average’ effect and by preventing the efficient reallocation of those resources to more productive uses. Heightened uncertainty created by the Brexit vote may also have encouraged firms to expand production by increasing inputs of relatively flexible labour rather than less easily reversed investment in capital.
- 1.18 It is notable that the ‘productivity puzzle’ is not just a UK phenomenon. For instance, the US Congressional Budget Office has made similar downward revisions to its productivity forecasts, as have the IMF and the OECD in their forecasts for many advanced economies. And weak investment and the impact of very low interest rates are plausible explanations for many countries. But it is also worth noting that some commentators have argued that the advanced economies have entered an era of permanently subdued productivity growth for structural reasons.
- 1.19 At the time of our March forecast, productivity growth had strengthened in 2016, averaging 0.4 per cent a quarter to leave productivity up 1.5 per cent in the year to the end of 2016, but this has proved yet another false dawn. The renewed weakness of productivity so far in 2017 may in part be a temporary effect of the Brexit vote and the uncertainty that it has generated. But given the bigger picture – both over time and across countries – it is clear that we will need to revisit our trend productivity growth assumptions again in November.
- 1.20 Our March 2017 forecast assumed that trend productivity growth would rise slowly to reach 1.8 per cent in 2021. Actual productivity growth averaged 2.1 per cent a year in the pre-crisis period, but has averaged just 0.2 per cent over the past five years. While we continue to believe that there will be some recovery from the very weak productivity performance of recent years, the continued disappointing outturns, together with the likelihood that heightened uncertainty will continue to weigh on investment, means that we anticipate significantly reducing our assumption for potential productivity growth over the next five years in our forthcoming November 2017 *EFO*.

## Labour market developments

- 1.21 The weakness of productivity growth has been accompanied by stronger-than-expected employment growth, ongoing falls in unemployment (to 4.3 per cent of the labour force, compared with our March assumption of 5.0 per cent for the equilibrium, or sustainable, rate of unemployment), and average hours rising a little rather than falling as assumed. Strong growth in hours worked, alongside weak earnings growth, suggests that we will also need to revisit our assumptions about potential labour supply. The Bank of England currently estimates that the equilibrium unemployment rate is around 4½ per cent. Given the impact of weak earnings growth on people's incomes, it may also be sensible to assume that the long-term downward trend in hours worked takes longer to reassert itself.
- 1.22 We will be considering all the relevant evidence in detail as we prepare our November forecast. Other things being equal a downward revision to prospective productivity growth would weaken the medium-term outlook for the public finances, while a lower sustainable rate of unemployment and more hours worked would strengthen it. The ONS's downward revisions to last year's budget deficit would also be beneficial, to the extent that they feed through to future years. That said, the downward revision to productivity growth is likely to have the largest quantitative impact.

## Refining our forecasts

### Lessons learnt

- 1.23 It is often the case that the lessons emerging from our *FERs* have already been acted upon because they were identified during an *EFO* forecast process. In some areas, that has been repeated this year. Lessons that have been reinforced include:
- the importance of the **composition of labour income**, in particular that employment-driven growth has been less tax-rich than earnings-driven growth would have been;
  - savings associated with **major reforms of the incapacity and disability benefits** systems had fallen short of expectations, due largely to challenges in delivering the reforms;
  - the challenges in forecasting **self-assessment (SA) income tax and capital gains tax** receipts, due to data limitations, the complex effects of behavioural responses to policy changes, the trend towards incorporations and shifts in the income distribution; and
  - the use of **local authority reserves**, which has been a repeated source of surprise relative to our forecasts – in both directions – with the latest surprise being the extent to which they were drawn down to support higher local authority spending in 2016-17.
- 1.24 There are also new issues and themes that have been identified in this year's evaluation:
- The importance of **corporation tax payment timing assumptions**. The speed at which companies pay off their liabilities arising from a particular year's profits can have a

marked effect on receipts. In addition, the surge in receipts from life assurance companies in 2016-17 suggests that we also need to look further at how the effect of bond price movements on profits in the sector are modelled.

- The unexplained downward **trend in tax credits and in-work housing benefit caseloads**. In recent forecasts we have made successive and substantial downward revisions to tax credits spending, with similar, if smaller, revisions to the in-work element of the housing benefit caseload. This appears to be related to lower-than-expected inflows (rather than higher-than-expected outflows) and to average incomes across the caseload rising faster than assumed. The underlying drivers of these forecast differences remain under investigation.
- The challenges and importance of the **in-year estimates for receipts and spending** that form the basis of our fiscal forecasts. As most of our models are specified to forecast the *growth* of a tax or spending stream from a starting point, any difference between forecast and outturn for the year in progress when the forecast is made will compound over the forecast period. We use the latest available data – including administrative data – when making these estimates, but the pattern of receipts or spending through the year can change and subsequent revisions can change the picture significantly, as has been illustrated clearly by the large revisions to 2016-17 since our March forecast.

## Review of fiscal forecasting models

- 1.25 In preparing our fiscal forecasts we utilise more than 350 models of varying size and complexity. The outputs are scrutinised during forecast rounds and model development work is undertaken between forecasts. This year we have introduced a more systematic approach to following up our analysis of fiscal forecasting differences and the issues raised in *EFO* forecasting rounds, working with our partners across government in doing so.
- 1.26 This review forms part of a broader process of model development. Over the past year, we have moved to new models in a number of areas, including the incorporations model used to adjust our income tax, NICs and corporation tax forecasts for the trend toward employees and self-employed individuals incorporating, as well as the model we use to estimate the proportion of consumer spending subject to the 20 per cent rate of VAT. We plan to move to a new North Sea revenues model in our November forecast.
- 1.27 We have reviewed 19 models in depth against the five criteria we set out last year (accuracy, plausibility, transparency, effectiveness and efficiency). Informed by this, we have identified some overarching issues that we plan to work on over the next year, including supplementing our microsimulation models with top-down approaches, reviewing the balance between short- and long-term dynamics in our econometric models and assessing the impact of significant policy changes on the modelling approaches we use.
- 1.28 As well as these general conclusions, we have attached a high priority to development work on three forecasting models:

## Executive summary

- **Onshore corporation tax:** in recent forecasts we have repeatedly under-predicted onshore CT receipts. We will work with HMRC to review the main industrial, commercial and financial sector components of this model, including the econometric equations we use to project key income and deduction streams. We are also working with HMRC to improve the transparency of the model and its outputs.
- **Self-assessment income tax:** we have repeatedly over-forecast receipts in recent years. This appears to be due to weakness in the effective tax rate, which has not been captured by the model. We will therefore be considering alternative approaches to modelling the effective tax rate. We will also work with HMRC and the ONS to investigate and better understand trends in the tax base and how these income streams are captured in the National Accounts.
- **Universal credit (UC):** as the rollout of UC accelerates over the next year, the spending flowing through the system will rise significantly. We currently factor UC into our forecasts as a marginal effect relative to the existing system rather than on a full-cost basis. This will become more problematic as outturn data will increasingly reflect UC rather than the system that is being replaced. The shift to UC also involves a number of complex changes in entitlement and the possibility that recipients' behaviour will change in response – e.g. take-up rates, error and fraud, and decisions about whether and how much to work. Assumptions in all these areas will need to be reviewed as evidence of actual effects becomes available. We will set out our latest UC modelling in detail in our next *Welfare trends report*, which will be published later in 2017-18.

## Comparison with past official forecasts

- 1.29 In Annex B we compare the absolute size of our forecast differences to the average across official forecasts made in the 20 years before the OBR was created, although any differences between our forecast record and that of the Treasury before us could be influenced by many factors beyond the control of the forecaster in question. We have so far produced 16 forecasts, but the sample that we can compare against outturns is still relatively small – especially at longer time horizons. We can compare only seven of our forecasts at a 4-year horizon and five at a 5-year horizon. And we have not yet had to forecast through a recession, which is typically when the largest differences arise – because their timing and depth are so uncertain. For what it is worth, our forecasts for real GDP growth and net borrowing have on average been more accurate than Treasury forecasts were on average over the previous 20 years.

## 2 The economy

### Introduction

2.1 The focus of this year's *Forecast evaluation report (FER)* is the performance of our March 2015 forecast (our last under the Coalition Government) and our March 2016 forecast (our last before the EU referendum). In this chapter we:

- show how **monetary policy and other market-derived assumptions** have differed from market expectations at the time of our forecasts (from paragraph 2.2);
- explain how **the rate and composition of real and nominal GDP growth** have evolved relative to our forecasts (from paragraph 2.5);
- assess developments in **individual sectors of the economy** (from paragraph 2.15), including the impact of **Blue Book 2017 changes** on the household saving ratio (Box 2.1) and **the effects of fiscal policy on GDP growth** (Box 2.2);
- consider movements in **the labour market and productivity** (from paragraph 2.31);
- discuss what these developments suggest for **the level and growth of potential output** (from paragraph 2.41) and consider the implications of this for our next forecast; and
- evaluate the early evidence about judgements that we made about **the effects of the vote to leave the EU** on the economic outlook (from paragraph 2.57).

### Forecast conditioning assumptions

#### Monetary policy

2.2 The Bank Rate assumptions underpinning our forecasts are based on market expectations at the time, derived from the price of interest rate swaps. As Chart 2.1 shows, at the time of our March 2015 forecast these implied that Bank Rate would rise gradually from 0.5 per cent to around 1.2 per cent by early 2017. In the event – as has been the case repeatedly since the financial crisis – Bank Rate was not increased during this period and these expectations were pushed back. By March 2016, market participants had partially priced in a cut in Bank Rate, reflecting the possibility of a vote to leave the EU and the expectation that that would prompt a monetary policy response. This proved to be the case.

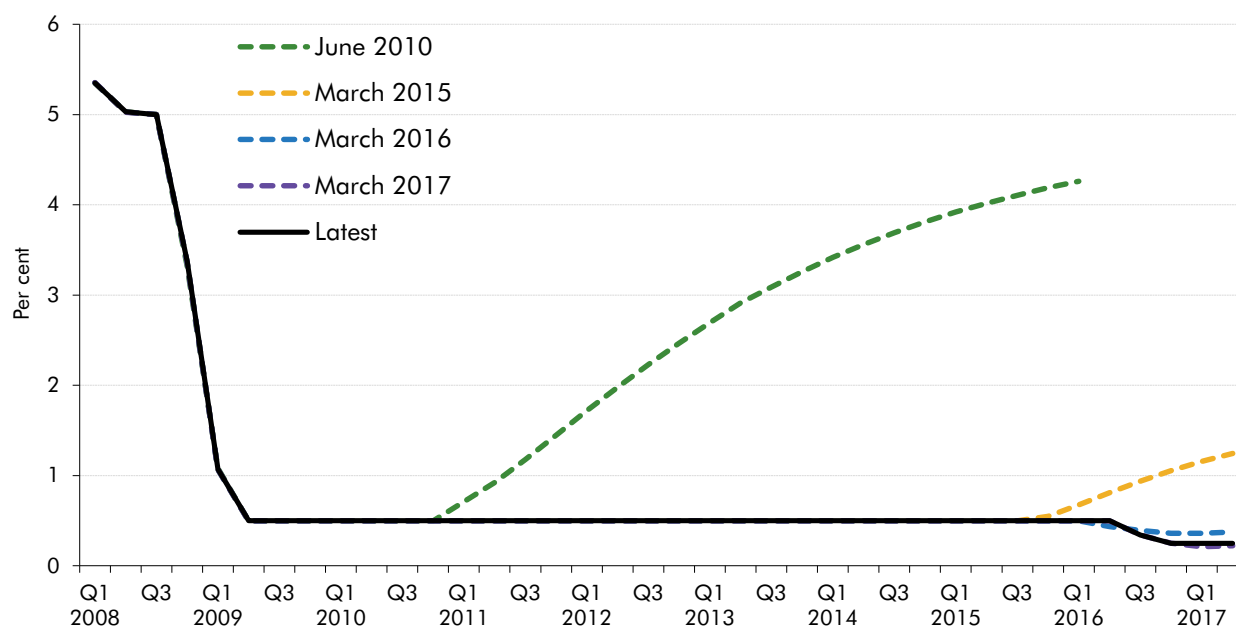
2.3 In August 2016, the Bank of England loosened monetary policy to cushion the effects of an expected weakening in GDP growth following the Brexit vote. The Bank's Monetary Policy Committee (MPC) judged that this would open up a margin of space capacity in the



## The economy

economy that would – after a temporary increase as the fall in the pound raised consumer prices – have caused inflation to undershoot the 2 per cent target.<sup>1</sup> The MPC cut Bank Rate from 0.5 to 0.25 per cent and deployed a range of other tools: adding £60 billion in gilt purchases and £10 billion in corporate bond purchases to its quantitative easing programme and introducing a £100 billion Term Funding Scheme (TFS), which provides relatively cheap funding to banks to encourage them to pass on the lower Bank Rate to customers. (The maximum size of the TFS has since been increased to £115 billion.)

Chart 2.1: Successive projections for Bank Rate



Source: Bank of England, OBR

## Other conditioning assumptions

2.4 Our economy forecasts are conditioned on a number of other market-derived assumptions, including oil, equity and government bond prices. These are important fiscal determinants. Table 2.1 compares our March 2015 and March 2016 assumptions to subsequent outturns for the second quarter of 2017:

- **Oil prices** fell in the second half of 2015 before recovering during 2016. These movements were largely matched in the oil price futures curve. As a result, our March 2015 assumption was too high while our March 2016 assumption was too low.
- **Gilt yields** have fallen well below the market expectations that we incorporated in both forecasts, mainly reflecting subsequent expectations that monetary policy would remain looser for longer. Lower long-term interest rates are also consistent with the market pricing in weaker future UK growth prospects after Brexit.

<sup>1</sup> The MPC's full description of the trade-off it faced when setting policy at its August 2016 meeting is set out in its 4 August 2016 'Monetary Policy Summary'.

- The sterling effective **exchange rate** index (ERI) started depreciating towards the end of 2015 as market participants started to factor in the possibility of a vote to leave the EU. This would require a lower exchange rate to offset the loss of competitiveness resulting from a less open trading relationship between the UK and the EU. Sterling then depreciated sharply immediately after the referendum as this possibility became a reality. It has been relatively flat since then – fluctuating with changing expectations of the form that Brexit, and the transition to it, will take.
- We assume that **equity prices** rise in line with nominal GDP from their value at the time of each forecast. They fell between March 2015 and March 2016, but then rose quite sharply in the second half of 2016 and early 2017, partly as the fall in the pound boosted the sterling value of multinational corporations' foreign-currency denominated profits. These companies make up a large share of the FTSE index.

Table 2.1: Conditioning assumptions for 2017Q2

	Oil price (\$ per barrel)	Equity prices (FTSE All-share)	Gilt rate (per cent)	ERI exchange rate (index)
March 2015 forecast	71.4	4031	2.3	90.1
March 2016 forecast	41.5	3419	1.8	86.0
2017Q2 average	50.3	4045	1.4	78.0
Difference <sup>1</sup>				
March 2015	-29.6	0.4	-1.0	-13.4
March 2016	21.1	18.3	-0.4	-9.3

<sup>1</sup> Per cent difference except gilt rate in percentage points.

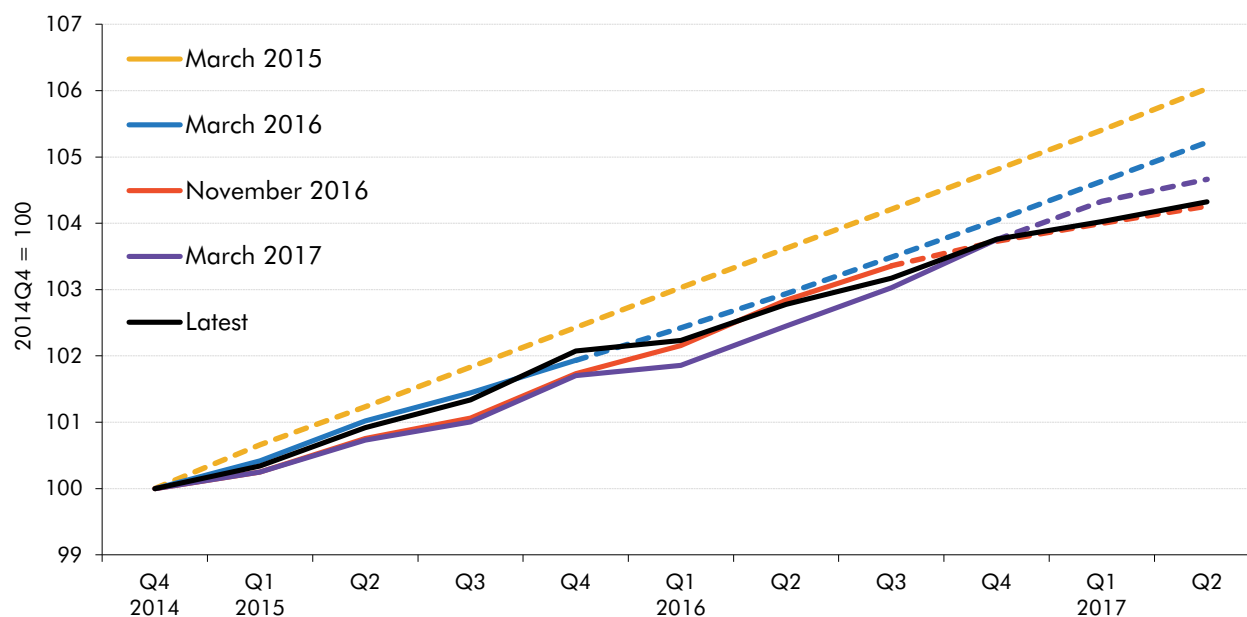
## The growth and composition of GDP

### Real GDP

2.5 Chart 2.2 shows that we revised down our real GDP growth forecasts between March 2015 and March 2016, mainly as a result of weaker outturn data. GDP growth disappointed relative to even this lower forecast over the first half of 2016, perhaps due to uncertainty in the run-up to the EU referendum. In our November 2016 forecast, we expected GDP growth to slow from the fourth quarter of 2016, as real incomes were squeezed by higher inflation on the back of the weaker pound. In our March 2017 forecast, we pushed this expected slowdown back to the second quarter of 2017 as data at the time showed that growth was stronger than we had expected in the two quarters following the referendum. On the latest ONS data, the slowdown came in the first quarter – one quarter later than we thought in November 2016 but one quarter earlier than we thought in March 2017. By the second quarter, the level of real GDP was 1.7 per cent below our March 2015 forecast and 0.9 per cent below our final pre-referendum forecast of March 2016.

## The economy

Chart 2.2: Real GDP outturns and forecasts



Note: Solid lines represent the outturn data that underpinned the forecasts at the time (the dashed lines).  
Source: ONS, OBR

## Nominal GDP

- 2.6 Public discussion of economic forecasts tends to focus on real GDP – the volume of goods and services produced in the economy. But the nominal or cash value is more important for the behaviour of the public finances. Tax receipts are driven more by nominal GDP and so is the share of GDP devoted to public spending, when a large proportion of that spending is set out in multi-year cash plans (public services, grants, administration and capital spending) or linked to consumer price inflation (social security and public service pensions).
- 2.7 Nominal GDP growth has held up better relative to our forecasts than real GDP because the GDP deflator – a whole economy measure of prices – has risen by more than we expected. Between the end of 2014 and the second quarter of 2017, cumulative growth in nominal GDP was only 1.0 per cent below our March 2015 forecast and was 0.7 per cent above our final pre-referendum forecast of March 2016.

## The expenditure composition of GDP

- 2.8 The composition of nominal GDP is also important for the public finances, since the effective tax rates on the different components of income and spending vary widely. So in order to assess the differences between our forecasts and outturns for the budget deficit, it is helpful to examine how the different components of GDP have evolved.
- 2.9 The largest source of real and nominal downside surprise relative to both our March 2015 and March 2016 forecasts was weaker-than-expected investment (Tables 2.2 and 2.3). Business and other private investment have made only small contributions to GDP growth since the end of 2014. Real private consumption growth has also fallen slightly short of both forecasts. Relative to our March 2016 forecast, the shortfall was more than offset by faster

consumer price inflation as the unexpected fall in sterling increased the cost of import-intensive goods and services leaving nominal consumption growth stronger than expected.

- 2.10 Relative to our March 2015 forecast, stronger-than-expected government spending offset part of the downside surprises in private demand growth. This reflected the very sharp cuts in departmental spending that the Coalition Government planned at the time but which the Conservative Government that took office in 2015 decided not to implement (as described in Chapter 3). Government spending growth was close to our March 2016 forecast.
- 2.11 Net trade has reduced real GDP growth by less than we expected. The fall in the pound resulted in significant upside surprises in both export and import prices. The difference has been greater for export prices, meaning that the terms of trade – the volume of imports that can be purchased for a given volume of exports – has boosted nominal GDP growth relative to our forecasts (Table 2.4).

Table 2.2: Contributions to real GDP growth from 2014Q4 to 2017Q2

	Percentage points						
	Private consumption	Business investment	Other private investment	Total government	Net trade	Stocks and statistical discrepancy	GDP
March 2015 forecast	4.5	2.1	0.4	-0.2	-0.8	0.1	6.0
March 2016 forecast	4.2	1.1	0.7	0.5	-1.0	-0.3	5.2
Latest data	4.1	0.5	0.2	0.4	-0.2	-0.7	4.3
Difference <sup>1</sup>							
March 2015	-0.3	-1.6	-0.2	0.6	0.6	-0.8	-1.7
March 2016	-0.1	-0.6	-0.5	-0.1	0.8	-0.4	-0.9

<sup>1</sup> Difference in unrounded numbers.

Table 2.3: Contributions to nominal GDP growth from 2014Q4 to 2017Q2

	Percentage points					
	Private consumption	Private investment	Total government	Net trade	Stocks and statistical discrepancy	GDP
March 2015 forecast	6.9	3.5	-0.7	-0.5	1.1	10.2
March 2016 forecast	5.8	2.6	1.1	-0.5	-0.6	8.4
Latest data	6.5	0.9	1.0	0.7	0.0	9.1
Difference <sup>1</sup>						
March 2015	-0.4	-2.5	1.7	1.2	-1.1	-1.0
March 2016	0.7	-1.7	-0.1	1.2	0.6	0.7

<sup>1</sup> Difference in unrounded numbers.

Table 2.4: Growth in National Accounts deflators from 2014Q4 to 2017Q2

	Per cent						
	Private consumption	Private investment	Total government	Exports	Imports	Terms of trade	GDP
March 2015 forecast	3.5	5.4	-2.4	-4.5	-4.7	0.1	3.9
March 2016 forecast	2.3	5.0	2.5	-0.6	-1.7	1.2	3.0
Latest data	3.5	1.3	2.5	7.2	3.9	3.2	4.6
Difference <sup>1</sup>							
March 2015	0.0	-4.1	4.9	11.7	8.5	3.1	0.7
March 2016	1.2	-3.7	0.0	7.8	5.6	2.1	1.6

<sup>1</sup> Difference in unrounded numbers.

## The income composition of GDP

- 2.12 In addition to breaking down changes in GDP between different categories of spending, we can also break them down between different categories of income. This is even more important for the public finances, given the amount of revenue raised from taxes on labour income and profits and because these components face different effective tax rates.
- 2.13 Table 2.5 shows that the differences in nominal GDP growth from both our March 2015 and March 2016 forecasts were fairly broad based across income components. Later in this chapter, we look at labour income in more detail as its composition has further implications for tax receipts.
- 2.14 Table 2.5 also shows a large contribution to the difference between the March 2016 forecast and outturn from the statistical discrepancy, which is the difference between the ONS headline measure of nominal GDP and the income measure of GDP. This reflects the fact that a large discrepancy was being reported in the data at the time we made our forecast, which is no longer apparent in the latest data.

Table 2.5: Contributions to GDP income growth from 2014Q4 to 2017Q2

	Percentage points					
	Compensation of employees	Corporations' gross operating surplus	Other income	Taxes on products and production	GDP	Statistical discrepancy
March 2015 forecast	5.1	1.6	2.8	0.6	10.2	0.0
March 2016 forecast	4.7	1.2	0.6	0.8	8.4	1.2
Latest data	4.8	1.6	1.7	1.0	9.1	0.2
Difference <sup>1</sup>						
March 2015	-0.3	-0.1	-1.2	0.3	-1.0	0.2
March 2016	0.1	0.4	1.1	0.1	0.7	-1.0

<sup>1</sup> Difference in unrounded numbers.

## Developments by sector

### Households

#### Income, spending and saving

2.15 Labour income<sup>2</sup> has grown faster than we expected in both the March 2015 and March 2016 forecasts, mainly as a result of stronger growth in ‘mixed income’ (a measure of self-employment earnings). Wages and salaries growth has been much closer to our forecasts, but its composition has been different with weaker average earnings growth offset by stronger employment growth. Average earnings growth provides a larger boost to income tax receipts than employment growth because it pulls more income into higher tax brackets (a process known as ‘fiscal drag’). Nominal disposable income growth has been lower than labour income growth, partly as social benefits income growth has been weak due to falling unemployment and the cash freeze on most working-age benefits.

Table 2.6: Income and consumption growth from 2014Q4 to 2017Q2

	Per cent, unless otherwise stated							
	Nominal disposable income	Labour income	Nominal consumption	Increase in price level	Real disposable income	Real consumption	Saving ratio (change, per cent)	Adjusted saving ratio <sup>1</sup>
March 2015 forecast	10.8	9.4	10.6	3.5	7.1	6.9	-2.0	0.2
March 2016 forecast	7.3	10.0	9.0	2.3	4.9	6.5	-1.0	-1.6
Latest data	7.9	12.0	10.0	3.5	4.3	6.3	-2.4	-1.8
Difference <sup>2</sup>								
March 2015	-2.9	2.5	-0.7	0.0	-2.8	-0.6	-0.4	-2.0
March 2016	0.7	1.9	1.0	1.2	-0.6	-0.2	-1.4	-0.3

<sup>1</sup> Change in the saving ratio, excluding the adjustment for pensions (per cent).

<sup>2</sup> Difference in unrounded numbers.

2.16 Despite the shortfall in nominal disposable income relative to our March 2015 forecast, nominal consumption growth was closer to forecast as the household saving ratio fell by more than we expected – particularly when the effect of the National Accounts adjustment for equity in pension schemes is excluded. While the saving ratio has fallen more sharply than either forecast predicted, its level is now actually higher than forecast due to large revisions in the 2017 Blue Book (Box 2.1).

<sup>2</sup> Here we define labour income as wages and salaries plus mixed income less households’ social contributions.

### Box 2.1: Blue Book 2017 and dividend income

In recent years there has been a significant increase in the number of people setting themselves up as single-director companies ('incorporations') rather than working as an unincorporated self-employed worker or an employee. This is likely to reflect the tax advantages of doing so, as well as underlying trends in the nature of work, as discussed in Box 4.1 of our November 2016 *EFO*. One implication is that a rising share of households' income will have been received as dividends from their own business rather than as wages and salaries or the mixed income measure of earnings from self-employment.

Dividend income is a component of household disposable income and, as such, affects estimates of household saving and net lending. Prior to this year's Blue Book, the Office for National Statistics (ONS) estimated the dividend income received by households using historical proportions of household income. In the Blue Book, it moved to using HMRC data and forecasts (which in turn are consistent with our tax forecasts), to derive an implied level of dividend income. The revised estimates should better capture the rise in incorporations. They imply a much higher level of household dividend income than previously estimated (Chart A) and, since they do not affect estimates of household consumption, a higher saving ratio (Chart B) and improved household net lending position. The upward revision to dividend income is offset in a downward revision to corporate net lending. The upward trend in incorporations means that the revisions to dividend income and household saving are larger in more recent years.

Chart A: Household dividend income

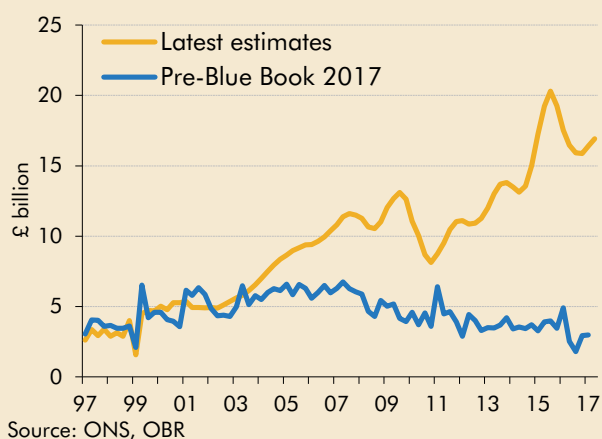
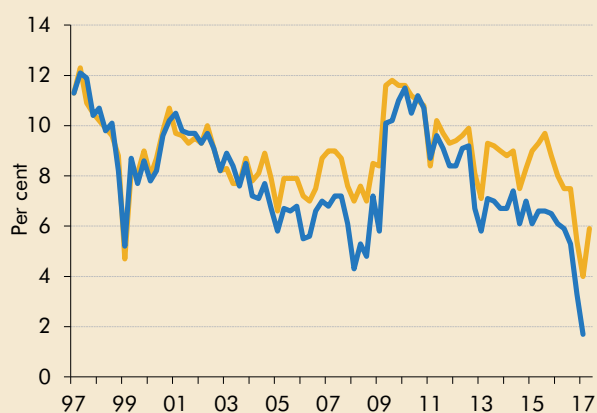


Chart B: Household saving ratio



The path of dividend income is more volatile in 2016 and 2017 than in earlier years due to the large amounts of income shifting that occurred ahead of the pre-announced dividend tax rise in April 2016 (discussed in Box 4.3 of our March 2017 *EFO*). The effect has been to raise dividend income significantly in the 2015-16 tax year, and to reduce it subsequently. Household disposable income is also reduced by the tax paid on this dividend income, which is generally paid with a lag of around a year through the self-assessment system. These tax payments are recorded in the National Accounts when the tax is paid, rather than accruing it to the point when the dividend income was received. This timing difference is a key factor in explaining the very low saving ratio in the first quarter of 2017, at which point dividend income was subdued because some had been brought forward into 2015-16 but tax payments were boosted by the lagged payment of self-assessed tax on that shifted dividend income.

## Consumer price inflation

- 2.17** In March 2015, the annual rate of CPI inflation stood at zero – significantly below the 2 per cent target the Government has set the Bank of England’s Monetary Policy Committee. At the time, we forecast that CPI inflation would pick up gradually over the remainder of 2015 and into 2016, to averages of 0.2 and 1.2 per cent in those years respectively. But inflation across this period came in lower than expected, largely due to falls in global food and oil prices, on top of a moderate appreciation of sterling. This was reflected in unexpected falls in fuel prices and in the food and non-alcoholic beverages category of the CPI.
- 2.18** Differences from forecast in the latter half of 2016 and so far in 2017 have been driven primarily by the unforeseen depreciation of sterling in the run-up to and since the EU referendum. Relative to our March 2016 forecast, this has resulted in large upside surprises in the import-intensive components of the CPI. The impact of sterling’s fall was exacerbated by a rise in global commodity prices, with food and beverage prices having increased by roughly 10 per cent in dollar terms since March 2016, while Brent crude oil prices have increased by more than 50 per cent in dollar terms over the same period.
- 2.19** We forecast RPI inflation using our CPI forecast plus our expectation for the RPI-CPI wedge.<sup>3</sup> So the differences between RPI inflation and our forecast are largely in line with those for CPI inflation. In March 2016, we forecast the RPI-CPI wedge to average 1.0 percentage points in 2016. In the event it averaged 1.1 percentage points, with a slightly higher contribution than expected from mortgage interest payments.

Chart 2.3: Forecasts and outturns for CPI



Source: ONS, OBR

<sup>3</sup> See Box 3.3 from our March 2015 *Economic and fiscal outlook* for our latest assessment of prospects for the RPI-CPI wedge.



## The economy

### Housing market

- 2.20 In June 2016, the ONS introduced a new house price index based on data from the Land Registry. Relative to the previous series, on which our March 2015 and March 2016 forecasts were based, the new index generally shows slower post-crisis rises in house prices, but the differences are not large. Both forecasts proved slightly too low relative to the latest data (Table 2.7), but the margin of difference is relatively small by historical standards.
- 2.21 In March 2015, we expected near-term property transactions to be depressed by the restrictive effects of the Mortgage Market Review on lending. In the event, this proved over-pessimistic as transactions increased sharply from the second quarter of 2015. They have been subject to policy-induced volatility recently, most notably the surge in transactions in March 2016 as buyers of buy-to-let properties and second homes sought to avoid paying the 3 per cent stamp duty surcharge that was announced in Autumn Statement 2015 for introduction in April 2016. We adjusted for this in our November 2015 and March 2016 forecasts, but significantly underestimated the magnitude of this ‘forestalling’.<sup>4</sup> Transactions since the second half of 2016 have been much more subdued than we expected, perhaps partly due to the uncertainty that has followed the referendum result.

Table 2.7: Growth in housing market indicators from 2014Q4 to 2017Q2

	Per cent, unless otherwise stated	
	House price growth	Property transactions
March 2015 forecast	14.1	5.9
March 2016 forecast	15.1	7.7
Latest data	15.5	2.9
Difference <sup>1</sup>		
March 2015	1.4	-3.0
March 2016	0.4	-4.8

<sup>1</sup> Difference in unrounded numbers.

### Corporations

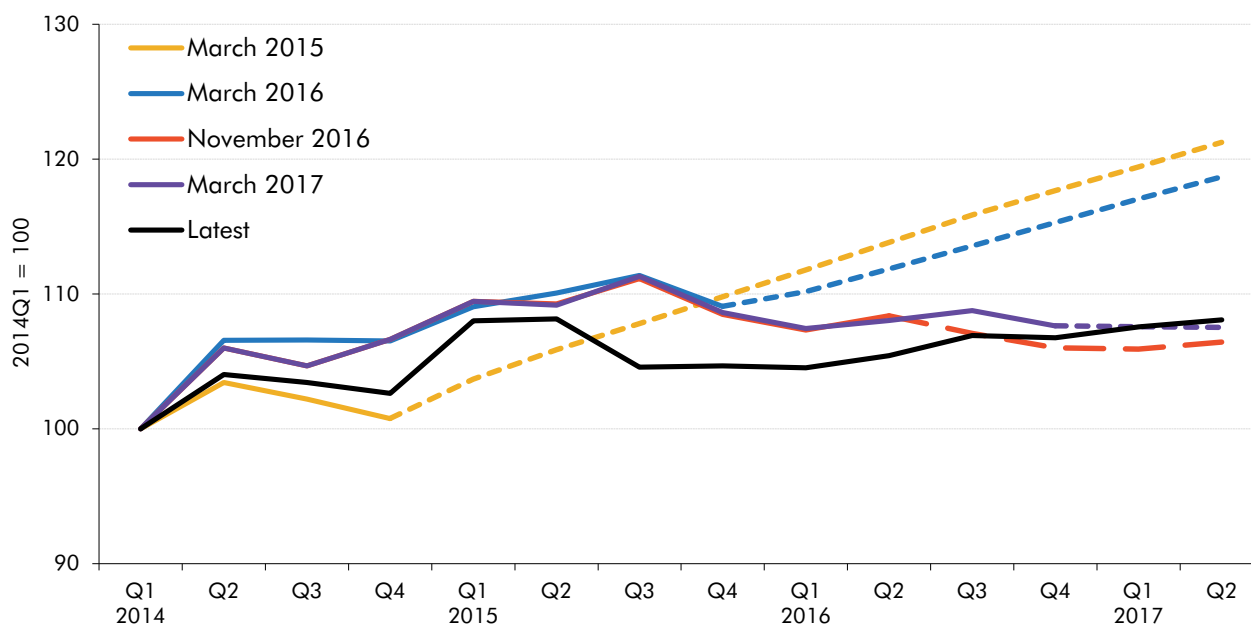
- 2.22 In March 2015, we expected business investment to grow strongly and to rise as a share of GDP as normally happens in the later stages of a recovery. We also noted, as we often do, that business investment data are subject to potentially large revisions. By the time of our March 2016 forecast, recent business investment growth had been revised up. But investment intentions surveys at that time suggested that uncertainty about the EU referendum was already leading to some capital spending decisions being cancelled or delayed, which prompted us to revise our forecasts down. We did not make any further referendum-related judgements beyond those implied by those survey indicators. In November 2016, we revised down our business investment forecasts significantly due to the additional uncertainty about investment returns created by the vote to leave the EU. This

<sup>4</sup> For more information see: Mathews (2016): Working paper No. 10: Forestalling ahead of property tax changes.

downward revision initially proved too great, with business investment reported to have been fairly flat through 2016 in the data available at the time of our March 2017 forecast.

2.23 In Blue Book 2017 the path of business investment in the run-up to and after the referendum has been revised significantly. The previous vintage of data showed it falling by around 1 per cent in the year to the second quarter of 2016 and flat in the year to the second quarter of 2017. The latest data show it falling 2½ per cent in the year before the referendum then rising 2½ per cent in the year since. This illustrates once again that business investment estimates are very volatile and prone to significant revisions. The most recent estimates are slightly at odds with the investment intentions surveys that informed our post-referendum forecasts.<sup>5</sup> Demand uncertainty generally makes firms wary of engaging in larger investment projects, which might prove difficult or expensive to reverse if the economy does not perform as hoped. A significant factor in the latest data revisions was the path of investment in aircraft, where use of a new data source suggests a sharp fall in purchases in the year prior to the referendum and a sharp rise since. Given the long lags between ordering and taking delivery of aircraft, this may reflect decisions made further in the past.

Chart 2.4: Forecasts and outturns for business investment



Source: ONS, OBR

2.24 Even on the revised data business investment has been significantly weaker than our pre-referendum forecasts. By the second quarter of 2017, the shortfall in business investment is 6 per cent relative to our March 2016 forecast and 15 per cent relative to our March 2015 forecast (Table 2.8). Residential investment growth has been much closer to both forecasts.

<sup>5</sup> For example, see Deloitte, *The CFO Survey*, Q1 2016.

Table 2.8: Growth in real private investment from 2014Q4 to 2017Q2

	Per cent		
	Business	Residential	Total
March 2015 forecast	20.3	12.6	17.4
March 2016 forecast	11.4	9.7	12.5
Latest data	5.3	12.1	5.3
Difference <sup>1</sup>			
March 2015	-15.0	-0.5	-12.1
March 2016	-6.1	2.3	-7.3

<sup>1</sup> Difference in unrounded numbers.

## The external sector and net trade

2.25 In March 2015, we forecast significant pick-ups in export and import growth over subsequent quarters. With import growth expected to outpace export growth, we forecast a substantial negative contribution to GDP growth from net trade. In March 2016, we revised down the expected pick-up in export growth by slightly more than import growth, in line with the latest outturn data and a weaker outlook for UK export market growth. This meant that we expected a slightly larger negative contribution from net trade.

2.26 In the event, while net trade reduced GDP growth, it has done so by less than we expected. Relative to our March 2015 forecast, this was because export growth fell short of our expectations by less than import growth. Relative to our March 2016 forecast, it was because export growth was higher than expected and import growth lower. The fall in the pound through 2016 may have contributed to these differences but it is too early to assess the full impact of the depreciation on trade. While the forecast differences for exports and imports in value terms were greater because of the effect of the depreciation on prices, the net effect was in the same direction as the real net trade contribution, with the trade deficit in the second quarter of 2017 narrower than expected.

Table 2.9: Growth in trade from 2014Q4 to 2017Q2

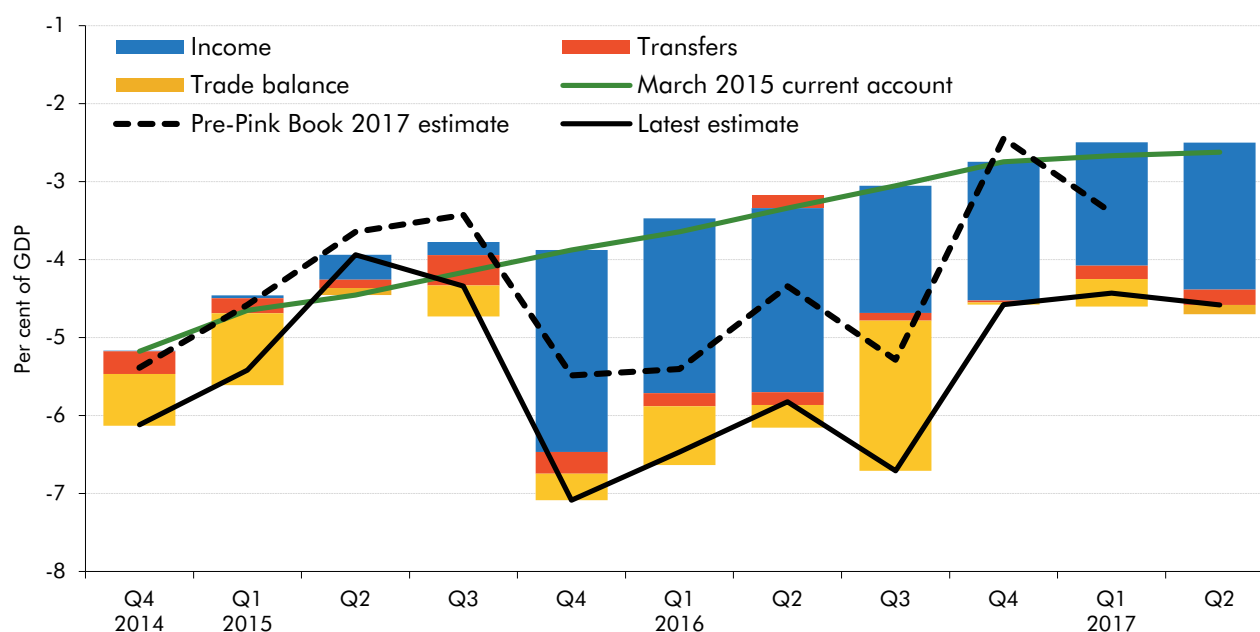
	Per cent, unless otherwise stated			
	Exports	Imports	Net trade contribution (ppts)	Trade balance in 2017Q2 <sup>1</sup>
March 2015 forecast	10.0	11.8	-0.8	-1.4
March 2016 forecast	7.3	9.9	-1.0	-2.4
Latest data	7.8	8.1	-0.2	-1.3
Difference <sup>2</sup>				
March 2015	-2.2	-3.7	0.6	0.1
March 2016	0.5	-1.7	0.8	1.1

<sup>1</sup> Trade in nominal terms, as a per cent of GDP.

<sup>2</sup> Difference in unrounded numbers.

2.27 Chart 2.5 shows how the current account and its components have evolved relative to our forecast from March 2015. At the time, we expected the current account deficit to narrow gradually, mainly due to a shrinking of the income deficit as the rates of return on the UK's overseas assets recovered and as the trade deficit narrowed a little. In data available at the time of our March 2017 forecast, these judgements appeared to be on track as the trade and income deficits gradually narrowed. However, revisions in the 2017 Pink Book dataset mean that the current account deficit is now estimated to be wider than previously thought. The ONS changed its method for calculating the rate of return on UK corporate bonds. As a significant portion of these bonds are held by non-residents and the new methodology implies higher rates of return, this revision results in a significantly wider income deficit. Current account data are another area where estimates are often revised substantially – trade in goods is mostly covered by timely and comprehensive data, but trade in services and cross-border income flows rely on less timely responses to surveys and other sources.

Chart 2.5: March 2015 current account forecast differences



Source: ONS, OBR

## Government

2.28 Our forecasts for the economy and public finances incorporate the tax and spending plans set out by the Government at the time. In the March 2015 Budget, the Coalition Government published plans for a sharp real-terms cut in public services spending between 2015-16 and 2018-19, although many observers doubted that it would be implemented. The planned year-on-year fall in 2016-17 was particularly striking. On this basis, our March 2015 forecast included a reduction in government consumption in both real and nominal terms between the end of 2014 and the latest quarter. In the post-election July 2015 Budget, the new Conservative Government significantly eased the cuts in departmental spending that had been pencilled in four months earlier. As a result, we revised up our forecasts for government consumption growth. By March 2016, we expected a substantial

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rise in spending in nominal terms. But even these revised forecasts proved too modest, with government consumption rising by almost 5 per cent in nominal terms between the end of 2014 and the second quarter of 2017 (Table 2.10).

- 2.29 In March 2015, again reflecting the spending plans sketched out by the Coalition, we forecast that government investment would be flat in nominal terms between the end of 2014 and the latest quarter. We revised that up significantly following the November 2015 Spending Review, when the Government increased its departmental capital spending plans. Following significant revisions in Blue Book 2017, it now appears that the path of government investment has been closer to our March 2015 forecast than to our post-Spending Review forecast of March 2016.
- 2.30 The arithmetic contribution of these government consumption and investment differences to our overall GDP forecast difference does not factor in all the ways fiscal policy affects growth or any offsetting factors (e.g. if faster growth in government spending were associated with faster growth in imports). We use ‘fiscal multipliers’ to assess the overall effect of changes in fiscal policy on growth. Our latest assessment of the assumptions we have made is set out in Box 2.2.

Table 2.10: Growth in general government spending from 2014Q4 to 2017Q2

	Per cent					
	Consumption		Investment		Total	
	Real	Nominal	Real	Nominal	Real	Nominal
March 2015 forecast	-1.4	-0.8	3.6	0.1	-0.9	-3.3
March 2016 forecast	2.3	3.6	1.8	13.9	2.3	4.8
Latest data	2.0	4.7	1.4	3.2	2.0	4.5
Difference <sup>1</sup>						
March 2015	3.5	5.5	-2.2	3.1	2.9	7.8
March 2016	-0.3	1.1	-0.4	-10.7	-0.3	-0.3

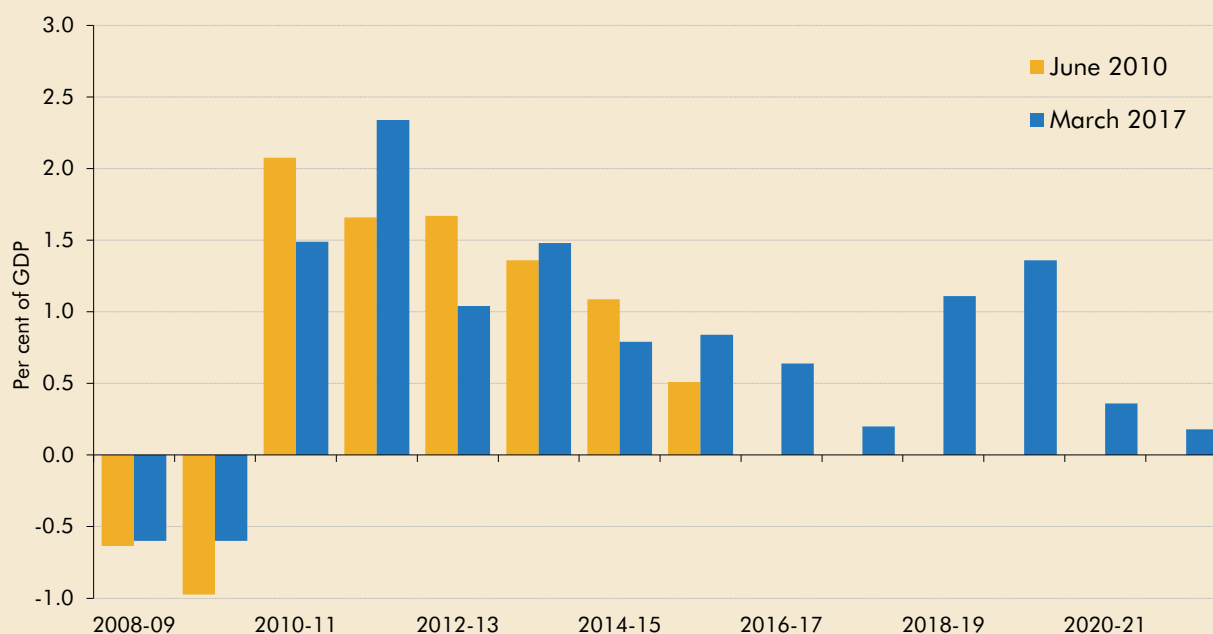
<sup>1</sup> Difference in unrounded numbers.

### Box 2.2: Fiscal policy and growth

Over the past six years there has been a large discretionary fiscal tightening in the UK. Chart C shows estimates of the additional tightening or loosening in each fiscal year, relative to a Budget 2008 baseline, as set out by the Institute for Fiscal Studies (IFS). This approach is based on summing announced changes in tax and spending plans, so is an ex ante measure of discretionary fiscal policy changes. The chart shows the plans for consolidation as set out in the June 2010 Budget, plus the IFS estimates produced after the most recent Budget in March 2017.

While the year-to-year profile of consolidation differed from the June 2010 plans, the average annual tightening was close to those plans (1.3 per cent of GDP a year from 2010-11 to 2015-16 versus the 1.4 per cent of GDP a year that was planned) The IFS's latest estimates show a smaller-than-average tightening in 2016-17 and modest one in 2017-18 before the pace increases sharply again in 2018-19 and 2019-20 due to planned cuts in current spending.

Chart C: Fiscal consolidation relative to Budget 2008 baseline



Source: IFS

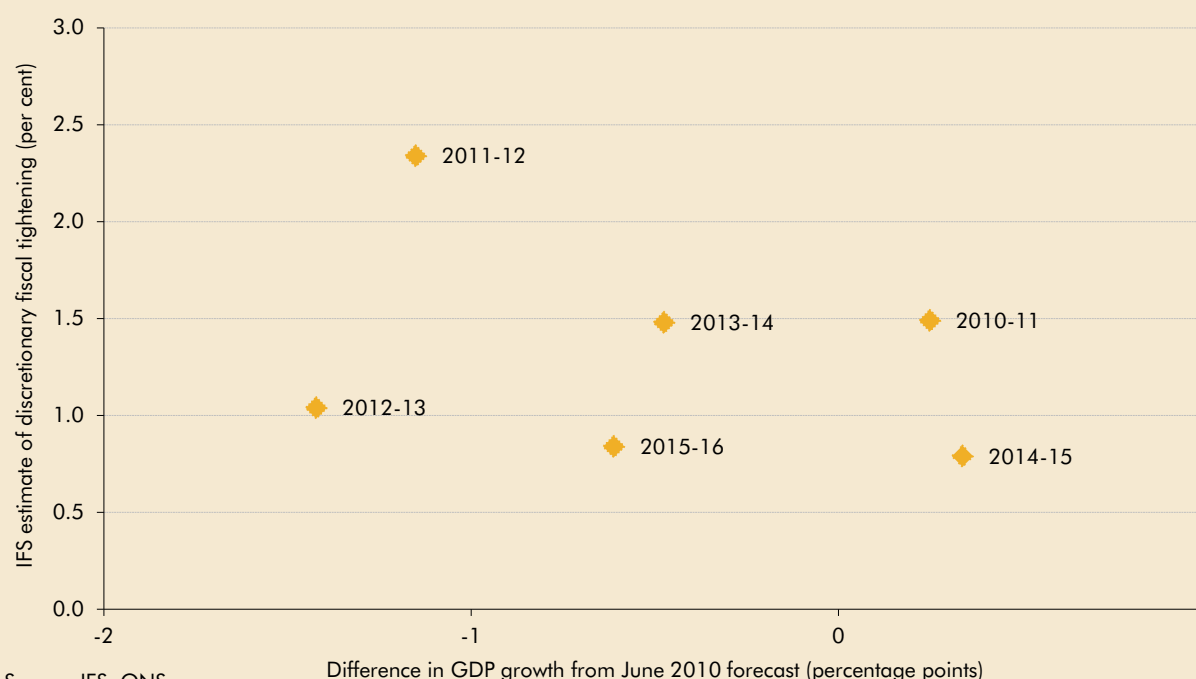
To assess the impact of the path of fiscal policy on GDP growth, we use estimates of fiscal multipliers, which are drawn from the available empirical literature. The estimates we use imply that a discretionary tightening of 1 per cent of GDP would reduce output by between 1 per cent (in the case of cuts to capital spending) and 0.3 per cent (for income tax and NICs increases) in the first instance. These were discussed alongside our first forecast in June 2010 and have been reviewed a number of times since then.<sup>9</sup>

There is significant uncertainty around fiscal multiplier estimates, with much debate over whether slow post-crisis growth could reflect higher or more persistent multipliers and a greater negative effect from fiscal tightening on actual or potential growth than we originally assumed. Looking at our GDP forecast errors relative to the profile of fiscal tightening, the evidence of that is limited. Our assessment has been, and remains, that other factors were more likely to explain these

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differences – notably the fluctuations in confidence and credit availability associated with the waxing and waning of the euro crisis. As Chart D shows, other than 2011-12 – when fiscal tightening was greatest and real GDP growth fell well short of our forecast – there is little correlation between the scale of fiscal tightening and GDP forecast differences. Most clearly, the largest growth shortfall relative to our June 2010 forecast comes in 2012-13, when the euro crisis intensified but fiscal tightening was somewhat less than in previous years.

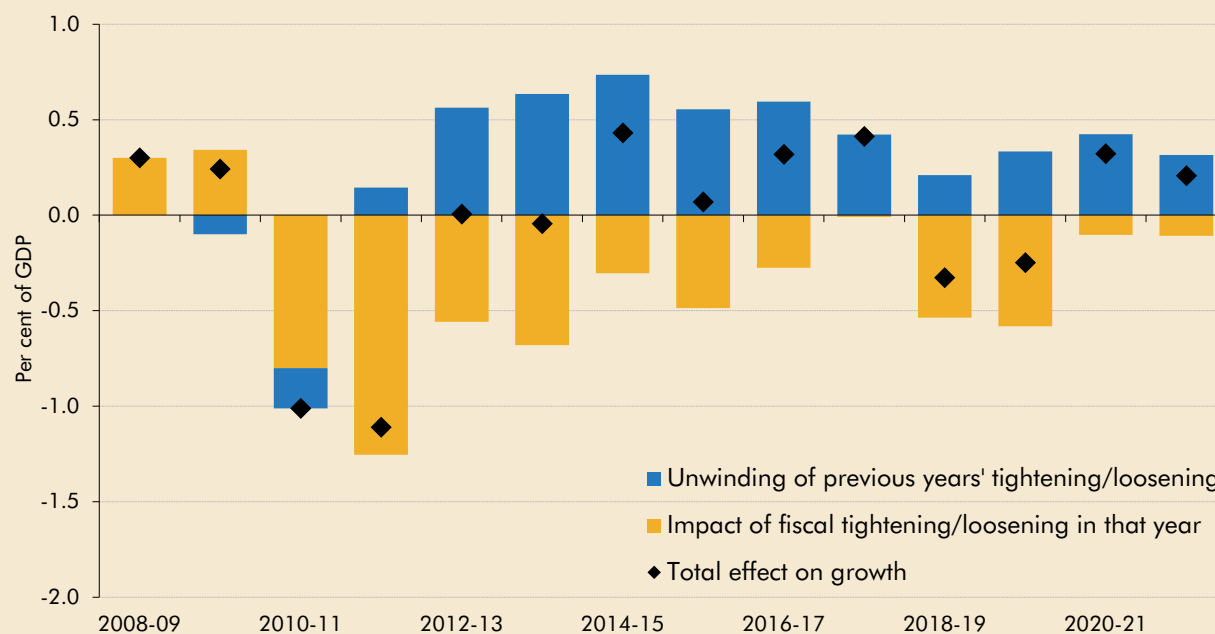
Chart D: GDP forecast differences versus the scale of fiscal tightening



We assume that these multipliers fall to zero over the medium term as the economy adjusts to the effect of policy changes through a number of processes – including, for example, the endogenous response of wages and prices to fluctuations in the degree of spare capacity in the economy, as well as possible changes in monetary policy.

An important consideration is the rate at which the effect of tightening (or loosening) in any given year is assumed to decay. We generally assume that the effect of a change in fiscal policy on GDP will unwind over a period of five years, which means that the effect of the multi-year consolidation on GDP growth in any year will reflect both the effect of new tightening in the year and, working in the opposite direction, the 'unwinding' of previous tightening effects. Chart E shows the impact of discretionary fiscal policy on GDP growth in each year between 2008-09 and 2021-22 based on the estimates in Chart C and an assumption that the impact tapers from the year of implementation. It suggests that in 2016-17 and 2017-18 the unwinding of previous years' effects more than offset that from new tightening in each of these years. As the pace of tightening picks up again in subsequent years, the implied impact of policy moves to a drag on GDP growth of 0.3 percentage points in 2018-19 and 0.2 percentage points in 2019-20.

Chart E: Implied impacts of discretionary fiscal policy on GDP growth



Source: IFS, OBR

As noted, the estimates set out above assume that the multipliers start to 'taper' from the point of implementation – the approach we used in June 2010 when the initial consolidation plans were set. But when those plans were subsequently adjusted we assumed the effect would taper from the point of announcement. Tapering from implementation assumes that the effect of pre-announced fiscal tightening is not offset by monetary policy or other factors in anticipation of implementation; tapering from announcement assumes that the effect is at least partly offset.<sup>b</sup>

<sup>a</sup> See pages 95 to 96 of our June 2010 *Economic and fiscal outlook*, Box 2.4 of our October 2012 *Forecast evaluation report*, Chapter 2 of our October 2013 *Forecast evaluation report* and Chapter 5 of our March 2014 *Briefing paper: Policy costings and our forecast* for more details on the size and persistence of the fiscal multipliers that we use.

<sup>b</sup> See Box 3.2 of our July 2015 *Economic and fiscal outlook* for a fuller discussion of this distinction.

## The labour market and productivity

- 2.31** Developments in the labour market are important for the public finances. The level and composition of labour income are both key determinants of tax receipts, while on a much smaller scale the level of unemployment influences welfare spending.
- 2.32** Unemployment had been falling steadily in the run-up to our March 2015 forecast. We expected the rate of decline to slow on the assumption that productivity growth would pick up from historically-low rates, allowing firms to increase output without having to expand their workforce at as fast a pace. But in fact, unemployment continued to fall at a similar pace. By March 2016 we had revised our unemployment forecast down in light of this, but it still fell faster than expected. Employment growth mirrored this pattern, rising faster than we expected in both March 2015 and in our upwardly revised March 2016 forecast.



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2.33 In both forecasts, we also expected the long-term downward trend in average hours worked to reassert itself on the assumption that a productivity-driven pick-up in average earnings growth would allow households to work fewer hours while maintaining desired rates of income growth. In fact, average hours increased slightly between the end of 2014 and the latest quarter. The combined effect of higher employment and average hours meant that total hours worked increased much more quickly than we expected.

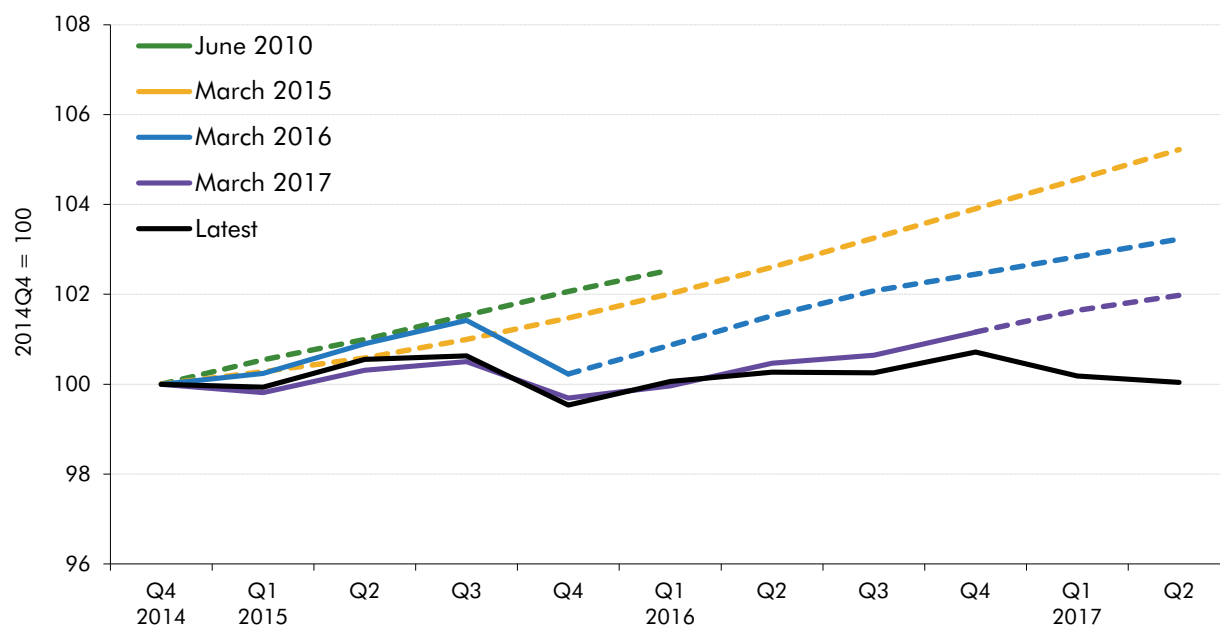
Table 2.11: Labour market indicators from 2014Q4 to 2017Q2

	Change in thousands, unless otherwise stated					
	Total employment	Unemployment (LFS)	Participation	Population	Average hours (per cent)	Total hours worked (per cent)
March 2015 forecast	632	-103	529	800	-1.0	1.0
March 2016 forecast	827	-204	623	861	-0.7	1.9
Latest data	1,131	-388	743	902	0.1	3.7
Difference <sup>1</sup>						
March 2015	499	-285	214	102	1.1	2.7
March 2016	304	-184	120	41	0.8	1.8
Memo: 2017Q2 levels	32,073	1,484	33,557	52,740	32.2	1,034

<sup>1</sup> Difference in unrounded numbers.

2.34 The fact that employment and hours worked were stronger than expected, while real GDP growth surprised to the downside, has meant that productivity has fallen well short of our recent forecasts on both the output-per-worker and output-per-hour measures. Chart 2.6 shows that we have had to revise down our productivity forecasts repeatedly. With output-per-hour actually falling in the first half of 2017 on current estimates, the level of productivity is now at the same level recorded at the end of 2014. Indeed, it is only 0.5 per cent above the level reached at the end of 2007, before the financial crisis struck.

Chart 2.6: Successive productivity forecasts and outturns



Source: ONS, OBR

2.35 Both the March 2015 and March 2016 forecasts assumed that average earnings growth would gradually pick up towards the rates seen before the crisis, thanks to productivity growth recovering. But repeating the pattern of recent years, wage growth has remained weak. Average earnings growth fell short of both forecasts by around 2 percentage points between the end of 2014 and the second quarter of 2017. Real wage growth from consumers' perspectives (as measured by the real consumption wage, which deflates earnings by consumer price inflation) was slightly less disappointing relative to our March 2015 forecast, as inflation was lower than expected over most of the period. Real wage growth from a firms' perspectives (as measured by the real product wage, which deflates earnings by the gross value added deflator) has been even weaker than from a consumers' perspective. While the real product wage has been slightly stronger than growth in productivity per worker – suggesting that the labour share of income has risen slightly over this period – the common weakness of the two suggests that they are related issues.

Table 2.12: Earnings, productivity and real wage growth from 2014Q4 to 2017Q2

	Per cent				
	Average earnings	Productivity per hour	Productivity per worker	Real product wage	Real consumption wage
March 2015 forecast	7.7	5.2	4.1	3.2	4.2
March 2016 forecast	7.2	3.2	2.5	3.8	4.6
Latest data	5.6	0.0	0.1	1.1	2.8
Difference <sup>1</sup>					
March 2015	-2.1	-5.2	-4.0	-2.1	-1.5
March 2016	-1.7	-3.2	-2.4	-2.8	-1.8

<sup>1</sup> Difference in unrounded numbers.

2.36 Comparing the latest estimates for GDP growth and the labour market in the first half of 2017 to our most recent forecast from March 2017 suggests that, after productivity growth averaging 0.3 per cent a quarter through 2016, the pattern of weak productivity and strong growth in labour inputs is repeating itself once more. Table 2.13 shows how real GDP growth in the first half of 2017, relative to the second half of 2016, fell short of our forecast by 0.4 percentage points (largely due to unexpected weakness in the first quarter). Once again, employment growth and average hours have surprised on the upside, each contributing an additional 0.4 percentage points to GDP growth in that period. But that was more than offset by the contribution of GDP-per-hour falling short by 1.2 percentage points.

Table 2.13: Contributions to GDP growth between 2016H2 and 2017H1

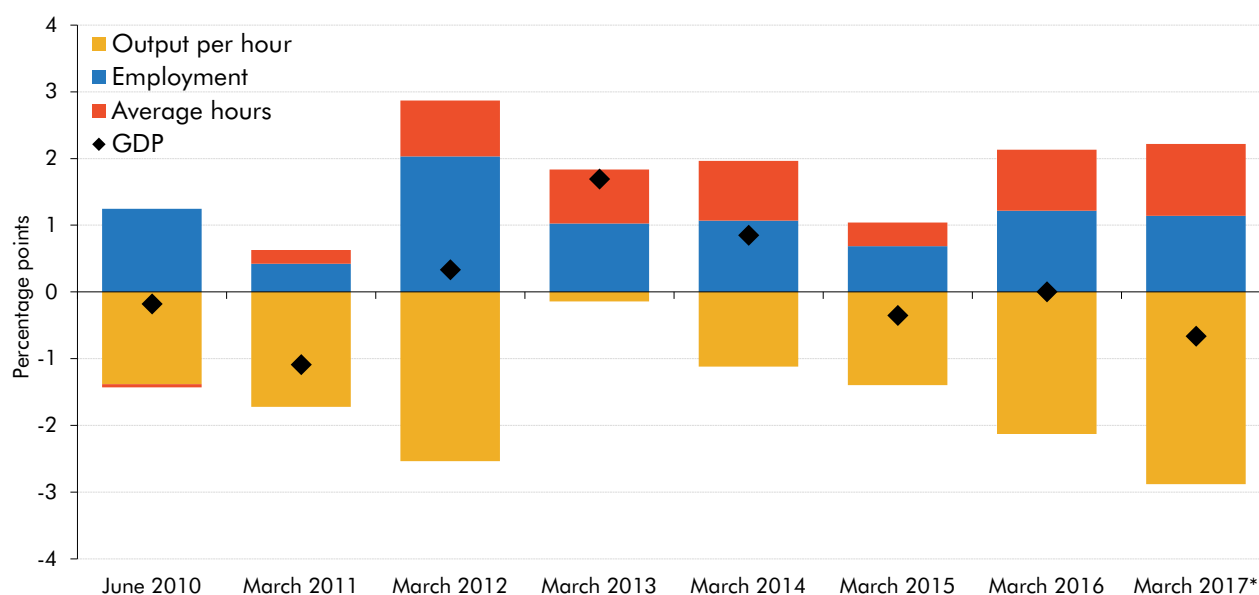
	Percentage points			
	GDP	GDP per hour	Employment	Average hours
March 2017 forecast	1.1	0.8	0.2	0.0
Latest data	0.7	-0.4	0.7	0.4
Difference <sup>1</sup>	-0.4	-1.2	0.4	0.4

<sup>1</sup> Difference in unrounded numbers.

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2.37 Chart 2.7 puts these latest forecast differences into context by plotting them alongside the same decomposition for each of our previous March forecasts and our first forecast from June 2010. The differences between our growth forecasts and the latest outturns show no consistent pattern: four were too pessimistic, three were too optimistic and our March 2016 forecast matched the latest ONS estimate. But in every case productivity growth has fallen short of our forecasts, while in every case employment growth has exceeded them. And average hours growth has exceeded every forecast but one.

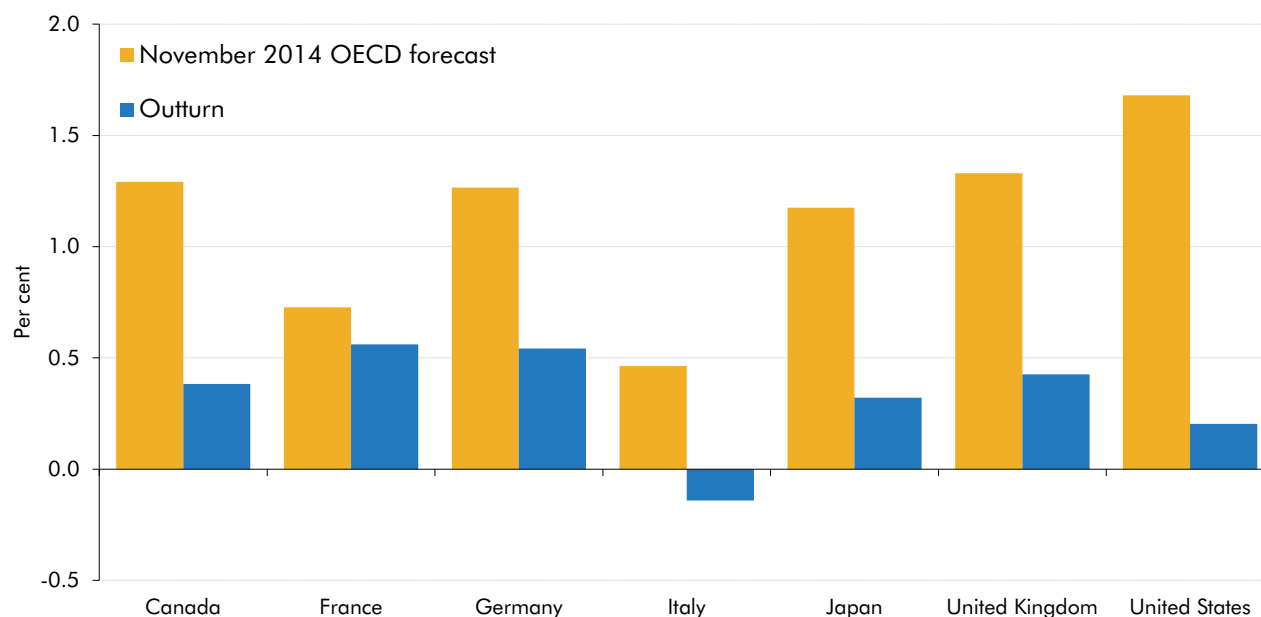
Chart 2.7: Contributions to year-ahead annual GDP growth forecast differences



\* Annualised growth between 2016Q4 and 2017Q2  
Source: ONS, OBR

2.38 Chart 2.8 puts the recent productivity growth shortfall into international context by comparing growth in output per hour in 2015 and 2016 across the G7 group of major advanced economies with the OECD's forecasts for them from November 2014. In every case, productivity growth was weaker than expected, suggesting that the recent forecast surprises we have experienced are by no means a purely domestic phenomenon.

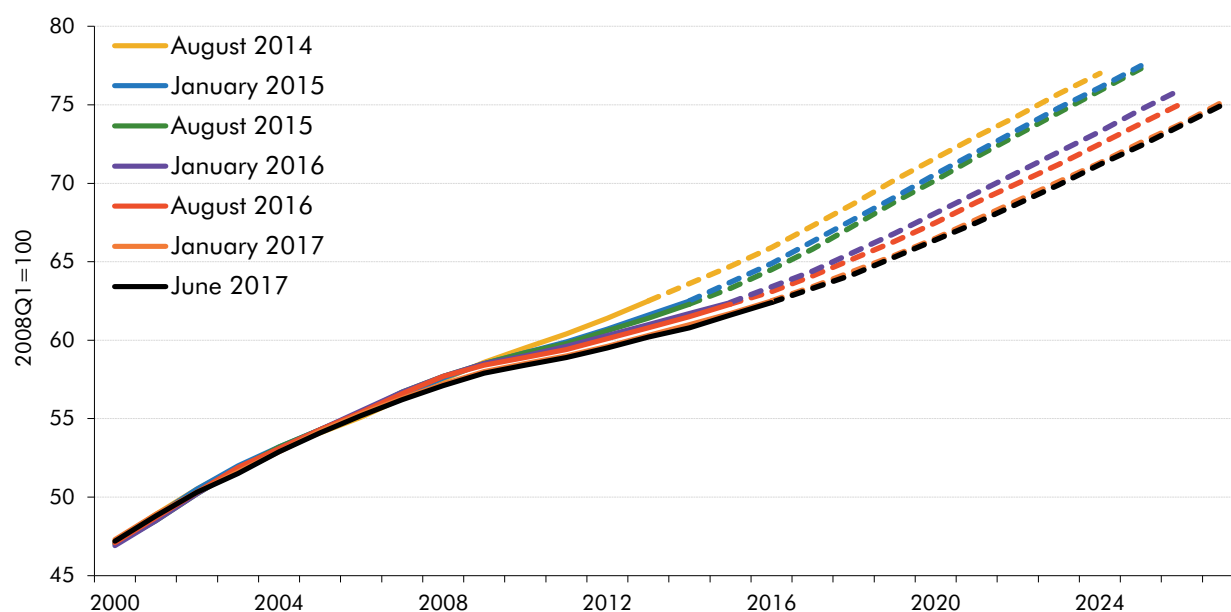
Chart 2.8: Average annual growth in output per hour in the G7 in 2015 and 2016



Source: OECD

2.39 To take one example, the Congressional Budget Office (CBO) in the US has also seen productivity growth disappoint repeatedly relative to its previous forecasts. It has responded with successive downward revisions, as shown in Chart 2.9. While the CBO thinks that there are some cyclical factors at play, they, like us, note that they do not fully understand the reasons for why trend productivity growth has slowed to this extent.<sup>6</sup> But, unlike in the UK – where productivity has moved sideways since the crisis – in the US, output per hour has still risen by almost 10 per cent since 2008.

Chart 2.9: CBO forecasts and outturns for US output per hour



Note: Solid lines represent the outturn data that underpinned the forecasts at the time (the dashed lines).

Source: CBO

<sup>6</sup> For more information about the CBO's forecasts, see *CBO's Forecasting Record: 2017 Update*, October 2017.

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- 2.40 The renewed weakness of productivity growth over the first half of 2017 will almost certainly have been exacerbated by the Brexit vote, notably by the temporary hit to real consumption and GDP growth resulting from the fall in the exchange rate. But we cannot ignore the increasingly lengthy period of weak underlying productivity growth, which is clearly in part a global phenomenon. For that reason, we are minded to revise down significantly our assumption for trend or sustainable productivity growth over the next five years in our forthcoming *Economic and fiscal outlook* in November. We discuss this further below.

## Potential output

- 2.41 Potential output cannot be observed directly so has to be estimated. When we consider it in each *FER* we therefore look at how our forecasts and judgements have evolved over time and how they compare with the relevant data on actual output growth and its components. Judgements about the growth in potential output are the most important – and among the most uncertain – in our economic forecasts.

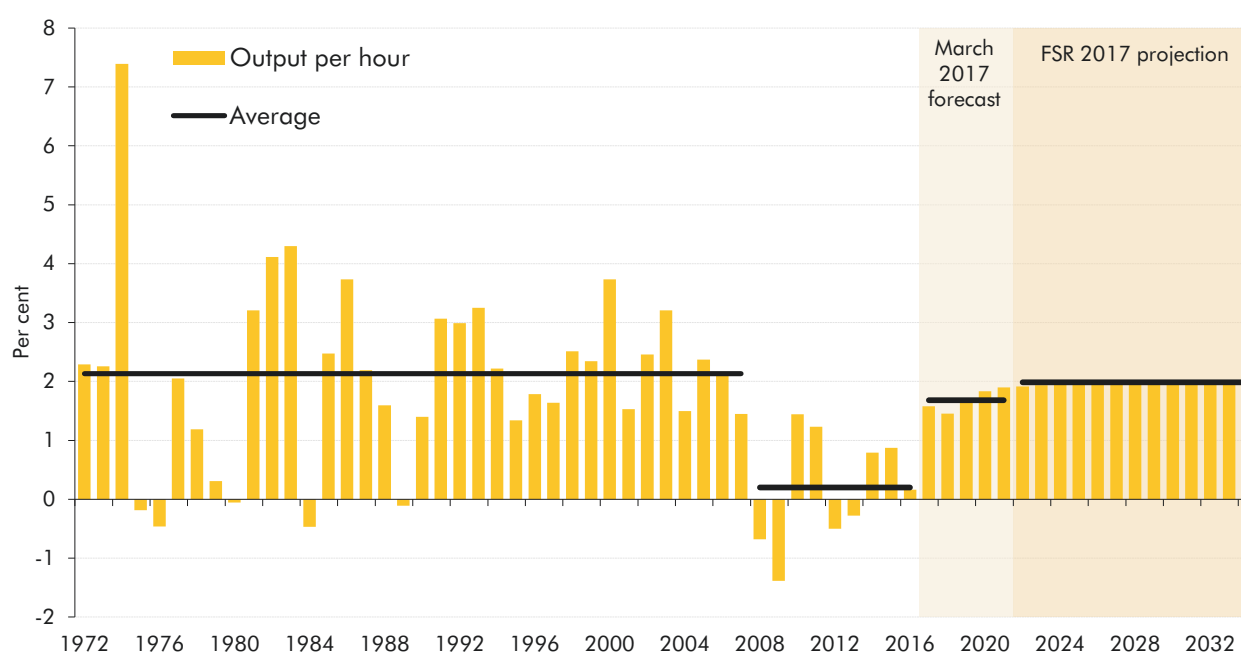
## Potential productivity growth

- 2.42 Within potential output, the outlook for potential productivity is most important of all. Up until March 2016, we had conditioned our forecasts on the assumption that the factors that had been holding back productivity growth in the post-crisis period (whatever they might be) would be temporary and would have faded completely by the end of the forecast period. Consequently we assumed that potential growth in output per hour would return to our estimate at the time of its pre-crisis average (2.2 per cent a year) by the final year of the forecast. (Revisions in the 2017 Blue Book mean that that average is now 2.1 per cent).
- 2.43 In March 2016, faced with another shortfall in productivity growth relative to our then latest forecast, we decided to place more weight on the evidence of the post-crisis period. We assumed that potential growth in output per hour would rise back to 2.0 per cent by the end of our forecast period – equivalent to a time-weighted average of the pre- and post-crisis periods (i.e. a historical average excluding the crisis years of 2008 and 2009).
- 2.44 In November 2016, we revised potential productivity down again – this time on the grounds that the Brexit vote and the UK's subsequent departure from the EU were likely to create greater uncertainty over investment returns and that this would lead some firms to cancel or postpone some productivity-enhancing capital investment projects (i.e. slowing 'capital deepening'). On this basis, we revised potential growth in output per hour down to 1.8 per cent by the final year of the forecast period. We did not assume that this effect would persist over the long term, sticking with a 2.0 per cent assumption beyond the medium term in our January 2017 *Fiscal sustainability report*.
- 2.45 We did not change our trend productivity assumptions in March 2017, so potential growth in output per hour was still expected to pick up slowly – from 1.4 per cent in 2017 to 1.8 per cent in 2021. At the time, the latest data suggested that output per hour had grown by 0.4 per cent per quarter on average in 2016 and was up 1.5 per cent on a year earlier by the final quarter of the year. Calendar year growth in 2016 was lower – at 0.5 per cent –

because of the base effect from the sharp fall recorded at the end of 2015. But, after revisions in Blue Book 2017, productivity growth in the 2016 calendar year has been revised down to 0.2 per cent and, as Table 2.13 showed, the first half of 2017 has seen productivity fall rather than continuing the positive quarterly growth rates recorded in 2016.

2.46 As a result, Chart 2.10 shows that – despite successive downward revisions to our productivity growth assumptions – our latest forecast implies a significant pick-up in productivity growth from the latest data and much higher rates than the post-crisis average.

Chart 2.10: Productivity growth



2.47 The ‘productivity puzzle’ has been with us for a number of years now and several possible explanations have been put forward to help explain it.<sup>7</sup> Given the scale of the productivity shortfall relative to the pre-crisis trend – around 21 per cent on the ONS measure – it seems likely that most of these factors will have contributed to some extent at one time or another. But what has been striking in recent years has been the way in which productivity growth has remained stubbornly weak despite the easing of many of the factors that have been put forward to explain it. In particular:

- **Labour hoarding:** in the early post-crisis period, it seemed plausible that firms might be holding onto labour at the expense of maintaining productivity in the face of the temporary extreme weakness in demand and output. But as the economy began to recover and hiring picked up alongside rising demand, that explanation quickly became less plausible.

<sup>7</sup> For more information about the ‘productivity puzzle’ and some of the possible explanations of its size and persistence, see ‘The UK productivity puzzle’, Bank of England 2014Q2 Quarterly Bulletin.

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- **The state of the financial system:** banks' need to repair their balance sheets after the crisis meant that the banking system was less efficient in its role in reallocating capital from weaker to stronger firms. This meant that weaker firms weighed on productivity growth for longer while stronger firms were unable to grow as quickly to boost it. While some legacy crisis-related issues remain at some banks, the system as a whole appears to be in much better health and credit availability is no longer constrained (thanks also to the Bank of England's interventions). So this explanation, upon which we had placed considerable weight at one time, also seems less plausible today.
- **Highly accommodative monetary policy:** some have suggested that monetary policy itself may be depressing productivity growth by allowing weaker firms to soldier on through alleviating the burden of servicing their debts, thereby slowing the reallocation of resources across firms. Based on market expectations for Bank Rate at the end of September 2017, any future tightening in monetary policy is expected to be modest, so if there is merit to this explanation it appears set to persist.<sup>8</sup>
- **Tightness in the labour market:** more recently, as unemployment has continued to fall, it was thought that a tighter labour market would put upward pressure on wage growth and force firms to seek productivity gains rather than further expanding labour input. The jury is still out on this explanation, but it is striking that the unemployment rate has reached a multi-decade low of 4.3 per cent – and a variety of other indicators point to a tight labour market – while average earnings growth has remained subdued and productivity flat. The lack of effect to date could reflect lags in the process rather than the process itself having broken down.
- **Weak investment:** the fall in business investment – in both intellectual property and physical assets – during the financial crisis slowed the pace of capital deepening and weighed on productivity growth. Business investment rose by almost 40 per cent between the end of 2009 and the second quarter of 2015, meaning that this explanation has received less weight more recently. But even after this rise from the post-crisis low, business investment today is just 5 per cent above its pre-crisis peak almost a decade ago; in contrast, a decade after the 1980s and 1990s recessions, investment was 63 and 30 per cent higher than the pre-recession peaks respectively. If business investment remains weak then this factor should continue to reduce productivity growth relative to the pre-crisis period.

**2.48** As the period of historically weak productivity growth lengthens, it seems less plausible to assume that potential and actual productivity growth will recover over the medium term to the extent assumed in our most recent forecasts. Over the past five years, growth in output per hour has averaged 0.2 per cent. This looks set to be a better guide to productivity growth in 2017 than our March forecast of 1.6 per cent (although the cyclical-structural split of the latest performance is uncertain).

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<sup>8</sup> For more information about the possible effect of monetary policy on UK productivity, see 'Productivity puzzles', Speech by Andy Haldane, 20 March 2017.

2.49 Looking further ahead, it no longer seems central to assume that productivity growth will recover to the 1.8 per cent we assumed in March 2017 within five years. Indeed, it is worth noting that some commentators have argued that advanced economies have entered an era of permanently subdued productivity growth for structural reasons.<sup>9</sup> We will take a final decision in our November forecast, based on all the information available at the time, but we expect to lower our forecast for cumulative potential productivity growth significantly over the next five years, without going so far as to assume that there is no recovery at all from the very weak performance of recent years. It is important to emphasise that whatever revision we make it will not have been driven by the most recent quarters of data – nor by a precise calculation of the likely impact of Brexit – but by looking again at the weakness of productivity growth over the whole post-crisis period and at the evidence that this is at least in part a persistent global phenomenon. As such, the change would relate entirely to our assessment of underlying prospects for potential productivity growth.

### Potential labour market activity rates and equilibrium unemployment

2.50 The impact of repeated productivity disappointments on GDP growth have been partly offset by upside surprises in labour input, at least some of which appears to be the result of stronger underlying labour supply. Faster-than-expected employment growth has in part reflected higher rates of labour market participation, including among older workers. Low interest rates have reduced the return on savings and made annuities more expensive, which may have affected retirement decisions. Policy changes, including the removal of the default retirement age and ongoing and prospective increases in the state pension age are also likely to have played a part in this. The reduced generosity of, and more onerous conditions attached to, out-of-work benefits may have also played a part in stronger-than-expected employment growth albeit at lower average productivity.<sup>10</sup>

2.51 The unemployment rate has fallen more rapidly than we expected since mid-2013. Indeed, it has continued falling when we expected it to stabilise and to start rising slightly in our more recent forecasts (Chart 2.12). Prior to our July 2015 forecast, we assumed that the sustainable equilibrium rate of unemployment would remain at 5.2 per cent across the forecast period, broadly in line with pre-crisis unemployment rates. In July 2015, we assumed that it would rise slowly from 5.2 to 5.4 per cent by 2020 as firms reduced employment as they adjusted to the costs of the new National Living Wage (NLW).<sup>11</sup>

2.52 In March 2017 we reduced our assumption for equilibrium unemployment at the start of the forecast period to 5.0 per cent, rising to 5.2 per cent by its end. This reflected the fact that unemployment had fallen below this rate with little apparent response from wage growth. Since March, the unemployment rate has continued to fall and wage growth has once again failed to rise to the extent we expected. On this basis it seems likely that the equilibrium rate of unemployment is lower than we assumed in March.

<sup>9</sup> For example, see 'The Rise and Fall of American Growth', by Robert J. Gordon, and 'US Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound', by Lawrence H. Summers.

<sup>10</sup> See 'The Labour Market', Speech by Michael Saunders, 13 January 2017, for more on factors that may have lowered the equilibrium rate of unemployment.

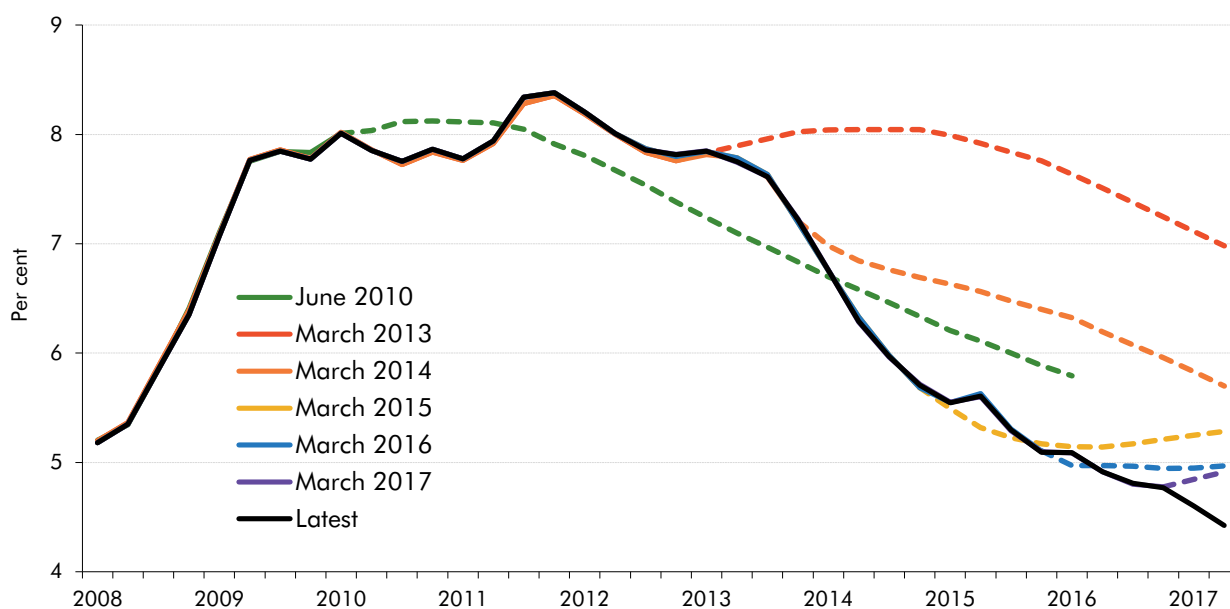
<sup>11</sup> See Annex B of our July 2015 *Economic and fiscal outlook*.



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- 2.53 The Bank of England reduced its estimate of equilibrium unemployment to around 4½ per cent in its February 2017 *Inflation Report*. We have previously noted conceptual differences between our measure of equilibrium unemployment and the Bank's – for example, due to differences in the horizon over which they are evaluated and the way in which they take into account factors such as the level of long-term unemployment.<sup>12</sup> But these differences are unlikely to be material at present, with long-term unemployment close to pre-crisis rates.
- 2.54 The implications of a change in the current estimate of equilibrium unemployment for our forecasts of employment and GDP growth would depend on how it affected other judgements. Would it imply more spare capacity or that potential productivity was lower than previously assumed and potential output unchanged? Given subdued wage growth, more spare capacity seems most likely. And would it have any implications for the small rise in equilibrium unemployment we foresee over the next few years? This seems unlikely since the basis of that judgement – that the NLW is set to rise faster than productivity growth over that period – has not changed.

Chart 2.11: Unemployment rate forecasts and outturns



Note: Solid lines represent the outturn data that underpinned the forecasts at the time (the dashed lines).

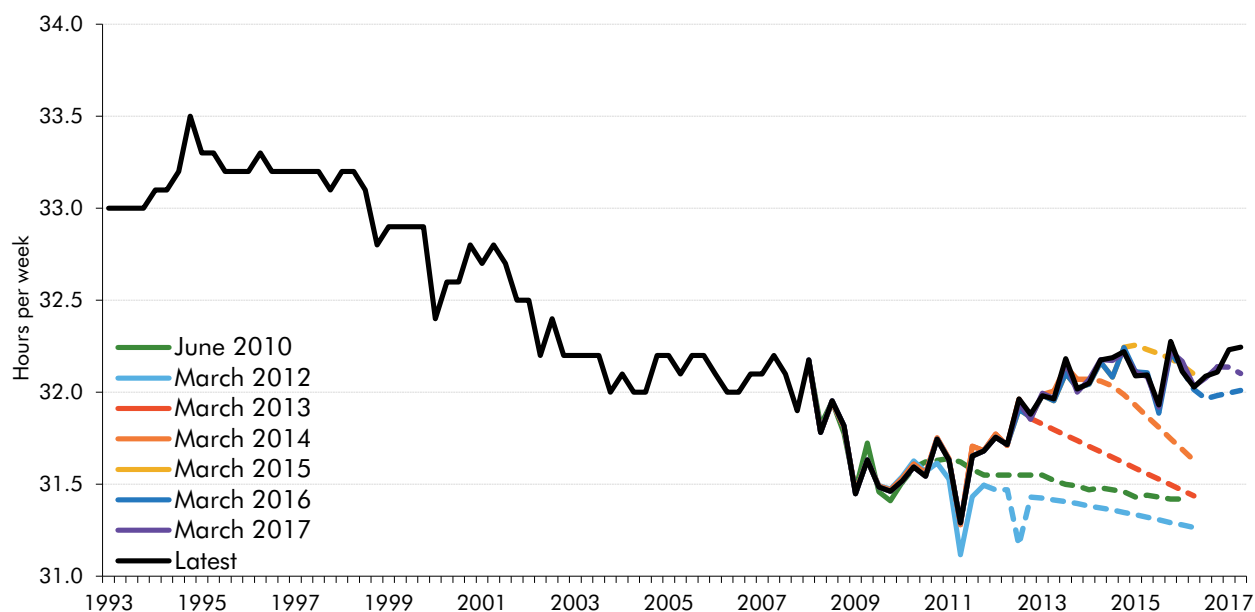
Source: ONS, OBR

## Potential average hours

- 2.55 Chart 2.12 shows that the average hours that people work each week have risen in recent years, contrary to our assumption that the long-term decline would soon reassert itself. This could be related to the shortfall in productivity growth, with people choosing to work more hours to support growth in their incomes in the face of weak productivity and earnings growth. Weakness in savings income in a low-interest rate environment is also likely to have played a role. To the extent that movements in productivity growth and average hours are related, a weaker outlook for productivity growth would seem to make it less likely that the long-term decline in average hours will reassert itself in the near term.

<sup>12</sup> See Box 3.1 of our March 2014 *Economic and fiscal outlook* for more details.

Chart 2.12: Average hours forecasts and outturns



Note: Solid lines represent the outturn data that underpinned the forecasts at the time (the dashed lines).  
Source: ONS, OBR

## Conclusion

2.56 As in previous *Forecast evaluation reports*, we find ourselves looking back on a period in which productivity and earnings growth have been weaker than expected and growth in hours worked stronger. As the period of post-crisis weakness in productivity growth lengthens, and not just in the UK, it seems less plausible to assume that the factors holding back productivity growth will fade substantially over the forecast period. In light of this, we expect to revise down our assumption for average potential productivity growth significantly in our November forecast. Partly offsetting that, we are likely to assume a lower equilibrium rate of unemployment and, at a minimum, less of a decline in average hours.

## Brexit-related judgements

2.57 In November 2016, we made some key forecast judgements regarding the near-term effects of the Brexit vote, some of which can be compared with the latest outturns:

- The fall in the pound would squeeze real incomes and real **consumer spending**. This judgement seems broadly on track, with CPI inflation well above our March 2016 forecast and even above our November 2016 forecast. But real consumption held up slightly better than expected as households ran down saving.
- The referendum result generated uncertainty about **investment** returns that would cause some investment to be postponed or cancelled. Business investment has indeed been much weaker than our March 2016 forecast, although slightly above our November 2016 forecast on the latest data. The quarterly data show it falling in the year before the referendum and then rising thereafter, but this in part reflects

## The economy

investment in aircraft where the lags between orders and delivery are long. More generally, the business investment data are so volatile and prone to significant revision that it is unwise to place much weight on the precise quarterly profile.

- The depreciation of sterling would boost **net trade in the short term**. While the direction of the effect has been as expected, the extent has not. While net trade has not dragged on GDP growth as we forecast in March 2016, it has provided less of a boost than we expected in November 2016.
- Exiting the EU would reduce **medium-term export and import growth** during the transition to a less trade-intensive economy. It is too early to assess this judgment.
- Exiting the EU would be associated with lower **net migration** than would have otherwise been the case, both because of weaker 'pull factors' – for example, the value of UK wages in prospective migrants' home currencies has fallen due to the depreciation of the pound – and the likelihood of a tighter migration regime in future. The latest data do suggest that net inward migration is slowing, consistent with the expected weakening of pull factors, but the Government has given no clear indication of the future migration regime at this stage.

# 3 The public finances

## Introduction

3.1 This chapter:

- gives an **overview of our public sector net borrowing (PSNB) forecasts** since June 2010 (from paragraph 3.2);
- discusses our **March 2015 and March 2016 PSNB forecasts for 2016-17** and the **receipts** (from paragraph 3.8) and **spending** (paragraph 3.37) forecasts that underpinned them;
- assesses our forecasts for **public sector net debt** in 2016-17 (from paragraph 3.62); and
- looks at the year-to-date path of **borrowing in 2017-18** relative to our March 2017 forecast (from paragraph 3.65).

## Forecasts since June 2010

3.2 The Office for National Statistics (ONS) has implemented some significant changes in the definition of key public finance statistics in recent years. These include:

- In September 2014, the ONS aligned the public sector finance statistics with the **2010 European System of Accounts (ESA10)**, as well as implementing other changes following its own review of the statistics.<sup>1</sup> The ONS's headline measure is now 'public sector net borrowing excluding public sector banks'. Our forecasts for government borrowing have been produced on that basis since then, but some we are reviewing in this section were for 'public sector net borrowing excluding financial sector interventions' under the 1995 European System of Accounts.
- A Government policy change announced in July 2015 prompted the ONS to review the classification of **housing associations** and to decide that they should be considered public rather than private corporations from a statistical perspective because of the degree of control over them exerted by Government.<sup>2</sup>

3.3 To ease comparability across forecasts and outturns, we have restated our earlier forecasts to bring them in line with these current definitions. Tables A.13 to A.16 in Annex A provide

<sup>1</sup> Chapter 4 of our December 2014 *Economic and fiscal outlook* detailed the effect of these changes on our fiscal forecasts.

<sup>2</sup> Annex B of our November 2015 *Economic and fiscal outlook* detailed the effect of this change on our fiscal forecasts.

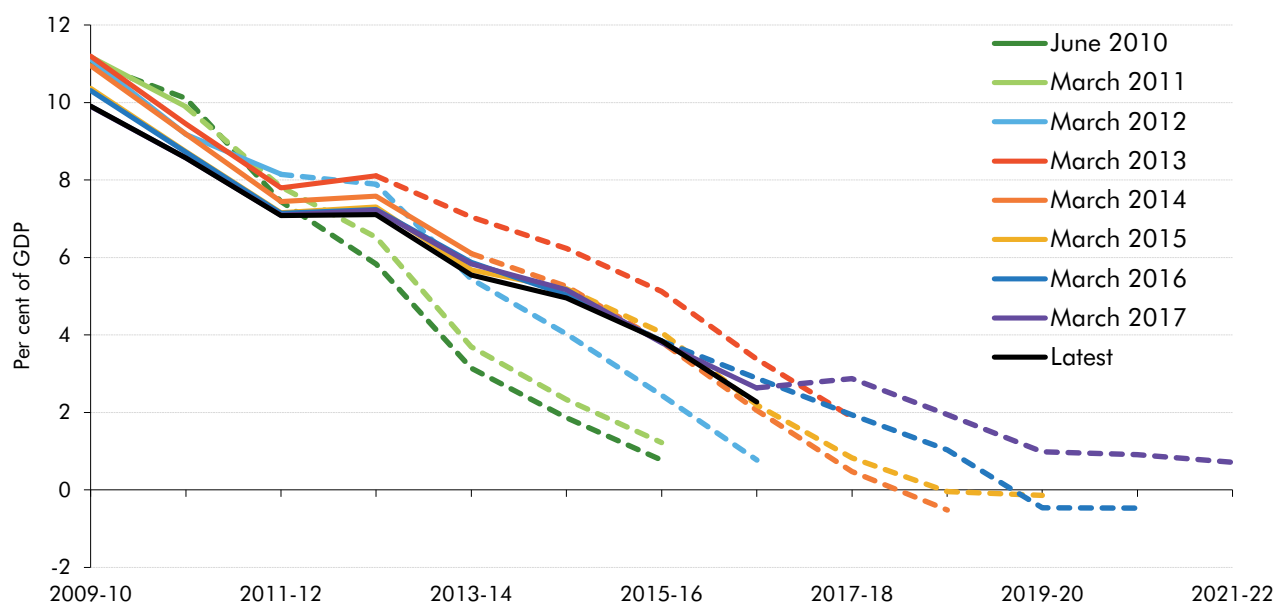
## The public finances

details on those restated forecasts. In a new briefing paper, we set out this methodology in more detail.<sup>3</sup> We have not restated our forecasts for every classification change given the time that would take and because the effects of most other changes are relatively small. These effects are separated out in our analysis of forecast differences. The largest change not adjusted for relates to the accounting treatment of corporation tax receipts, where restating past forecasts would be a highly resource intensive process.

3.4 Chart 3.1 shows that the deficit has not fallen as fast as our earlier forecasts predicted:<sup>4</sup>

- PSNB fell by 2.8 per cent of GDP in the **two years to 2011-12**, less than the 3.6 per cent of GDP decline that we forecast in June 2010 (on a comparable basis);
- deficit reduction then slowed significantly in **2012-13**, falling by 0.5 per cent of GDP when the one-off transfer of Royal Mail's historic pension fund is excluded and otherwise remaining flat as a share of GDP;
- PSNB fell by 1.1, 0.6 and 1.1 per cent of GDP respectively in **2013-14, 2014-15 and 2015-16** (from a 2012-13 level that excludes the Royal Mail transfer) broadly in line with our forecasts from December 2014 onwards; and
- PSNB fell by 1.6 per cent of GDP in **2016-17** on the latest ONS estimates, slower than our earlier forecasts predicted, but faster than our more recent ones did.

Chart 3.1: Restated forecasts and outturns for public sector net borrowing



Source: ONS, OBR

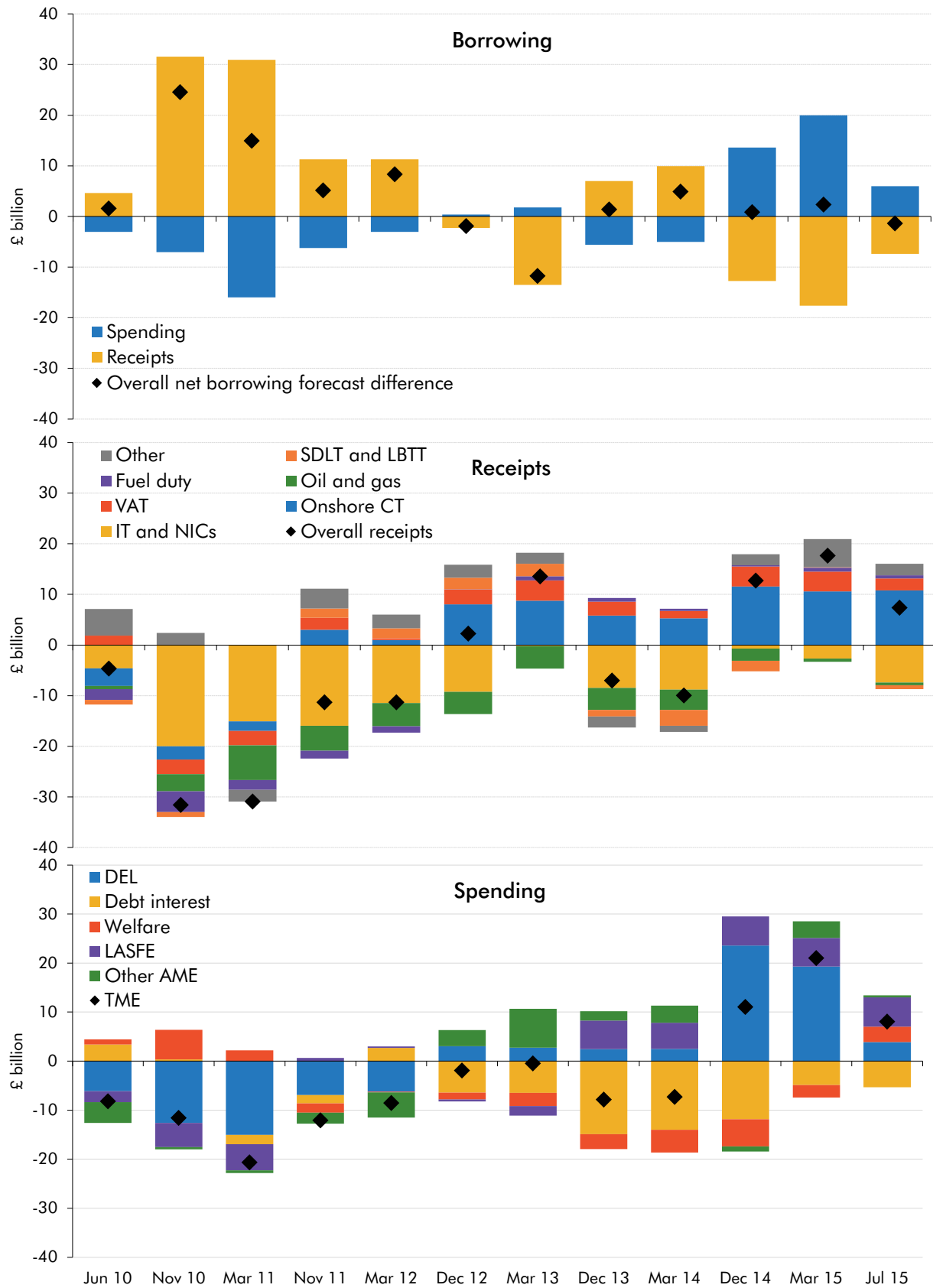
<sup>3</sup> See Briefing paper No.7: *Evaluating forecast accuracy* on our website.

<sup>4</sup> The GDP denominator used here is consistent with the ONS Quarterly National Accounts release on 29 September 2017.

3.5 Chart 3.2 sets out the drivers underpinning those forecast differences at a 2-year horizon.

- The top panel shows that up to March 2012, our **borrowing** forecasts were too optimistic, with underperforming receipts only partly offset by lower-than-expected spending. Since then, our borrowing forecasts have been subject to smaller differences that have also been in both directions.
- The middle panel shows that **receipts** forecast differences have been dominated by weaker-than-expected income tax and NICs – the result of productivity-related weakness in earnings growth and a lower-than-expected effective tax rate. The latter is likely to reflect changes in the earnings distribution, including among the self-employed, and subsequent policy changes (e.g. to the income tax personal allowance). This has been offset in recent years by the strength in onshore corporation tax, which partly reflects a change in ONS accounting treatment (discussed in more detail below).
- The bottom panel shows that our early **spending** forecasts overestimated spending by local authorities and non-interest spending by central government, while our more recent forecasts overestimated debt interest spending and underestimated local authorities' spending. Despite more timely quarterly data on local authorities' spending now being available, it has remained challenging to predict how they will use reserves to adjust the path of spending relative to their local sources of finance (including council tax and business rates). Our early overestimates of spending came as they built up reserves despite the pressure on local government budgets resulting from fiscal consolidation. Our recent underestimates reflect the reversal of that pattern, with reserves being drawn down in order to maintain higher levels of spending. Large underestimates of DEL spending in our December 2014 and March 2015 forecasts reflected subsequent policy changes following the 2015 General Election.

Chart 3.2: Two-year-ahead forecast differences: Borrowing, receipts and spending



Note: Forecasts have been adjusted for ESA10 and housing associations. Corporation tax forecasts have not been adjusted for accounting treatment changes.  
Source: ONS, OBR

## 2016-17 in detail

3.6 Table 3.1 sets out our March 2015 and March 2016 forecasts differences for public sector net borrowing (PSNB) in 2016-17. It shows that:

- Against our **March 2015 forecast**, borrowing was around £2½ billion higher than expected. That difference is more than explained by policy changes, in particular the large increase in departmental spending plans following the 2015 General Election. Abstracting from policy changes and classification effects (in particular the change in the accounting treatment of corporation tax), borrowing was slightly lower than our forecast. Higher-than-expected receipts, particularly from onshore corporation tax, VAT and capital gains tax, were partly offset by higher-than-expected spending, in particular much higher self-financed spending by local authorities.
- Our **March 2016 forecast** was too pessimistic. Abstracting from classification changes and subsequent policy changes, borrowing was around £4 billion lower than expected. That again reflected stronger-than-expected onshore corporation tax, VAT and capital gains tax as well as lower tax credits spending and changes in the timing of expenditure transfers to the EU within the 2017 calendar year.

Table 3.1: 2016-17 receipts, spending and net borrowing forecasts

	£ billion							
	Forecast <sup>1</sup>	Outturn	Difference	of which:				Memo: like-for-like difference <sup>2</sup>
				Classification changes	Policy changes	Economic factors	Fiscal forecasting difference	
<b>Borrowing (PSNB)</b>								
March 2015	42.7	45.0	2.4	-8.5	12.1	-1.5	0.3	10.9
March 2016	55.9	45.0	-10.9	-8.1	0.9	-0.5	-3.2	-2.8
<b>Receipts (PSCR)</b>								
March 2015	708.6	726.2	17.6	5.6	5.5	-0.5	7.1	12.0
March 2016	717.3	726.2	8.9	4.3	0.0	1.9	2.7	4.6
<b>Spending (TME)</b>								
March 2015	751.3	771.3	20.0	-2.9	17.6	-2.0	7.4	22.9
March 2016	773.3	771.3	-2.0	-3.8	0.9	1.4	-0.5	1.8

<sup>1</sup> Forecasts have been restated to reflect the reclassification of housing associations to the public sector.

<sup>2</sup> Excludes the effect of classification changes.

3.7 It is always important to stress that initial estimates of PSNB can be revised significantly over subsequent months as more reliable data become available. Box 3.1 sets out how our most recent forecasts and outturns for 2016-17 have changed over time.

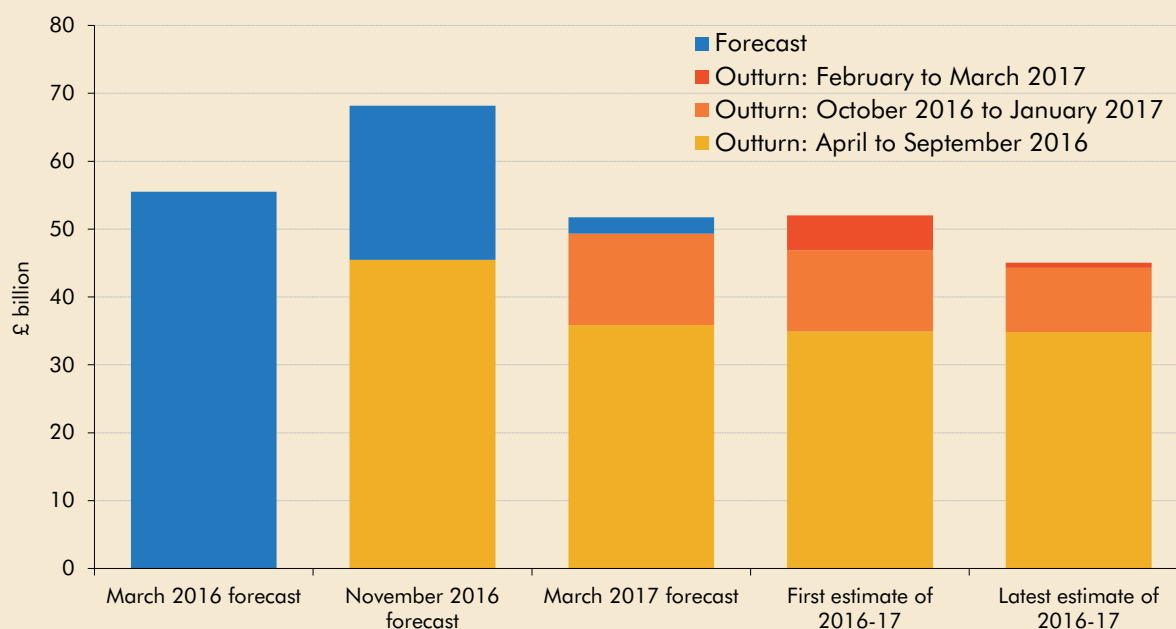


### Box 3.1: Revisions to borrowing in 2016-17

The September 2017 estimate of PSNB in 2016-17 is £45.0 billion. That is £7.0 billion lower than the initial ONS estimate published in April and between £6.7 and £23.1 billion lower than our three most recent forecasts. Chart A sets out how the public finances data and our forecasts for 2016-17 evolved in the period after our March 2016 forecast was presented:

- Our **November 2016 forecast** was based on published ONS outturn data for the first six months of 2016-17, which showed a 4.8 per cent fall in borrowing relative to the previous year, much slower than was implied by our March 2016 forecast. So, on a like-for-like basis, we revised our 2016-17 forecast up by £12.2 billion to £68.2 billion. Revised data for the first six months of 2016-17 now show a much larger year-on-year fall of 19.9 per cent.
- Our **March 2017 forecast** utilised a further four months of outturns. By then, PSNB in the first half of the year had been revised down by £9.6 billion, of which £7.7 billion reflected the move to recording corporation tax on a time-shifted accruals basis. Underlying receipts growth from October to January was also stronger-than-expected. We revised our PSNB forecast down by £13.4 billion on a like-for-like basis to £51.7 billion.
- The **initial ONS estimate** of 2016-17 PSNB (released in April) was £52.0 billion, just £0.3 billion above our March 2017 forecast produced the month before.
- The **latest ONS estimate** of 2016-17 PSNB (released in September) has been revised down by £7.0 billion relative to the initial estimate, to £45.0 billion.

Chart A: PSNB in 2016-17



Source: ONS, OBR

Table A sets out the drivers of the difference between our March 2017 forecast for 2016-17, the first ONS estimate released in April and the latest estimate (which will remain subject to revision for some time). In this table we have adjusted our forecast up by £0.3 billion to account for the effect of ONS classification changes that affect the recording of several small items of receipts and spending. These have been announced (so we include them in our forecasts) but not implemented (so they are not yet included in the outturn data).

On this basis, the difference between our March forecast and the initial estimate was just £5 million. That reflected a number of offsetting factors, including higher local authority borrowing but also higher income tax and NICs receipts and lower departmental spending.

Between April and September, the ONS revised PSNB in 2016-17 down by £7.0 billion. Methodological and classification changes implemented in the September data release explain £1.3 billion of the revision (the bulk relating to public sector pension schemes). The remaining £5.7 billion revision has been broad-based, with central government receipts revised up, central government spending revised down and local authority borrowing also lower. Only public corporations' borrowing – revised up £0.1 billion since April – has had an offsetting effect.

Relative to our March forecast, Table A shows that on the basis of the latest estimates:

- **Income tax and NICs receipts** were £3.5 billion higher last year than we thought in March. Around £2 billion reflects receipts on stronger-than-expected bonuses in the financial and business services sectors at the end of the year. On an unchanged assumption about growth in bonuses, this would lead to higher receipts in each year of the forecast. The remaining £1½ billion reflects alignment of outturn data with the latest HMRC trust statement.
- **VAT receipts** were £0.9 billion higher than expected. Most of this reflects timing effects on cash receipts in the early part of 2017-18 that accrue back to 2016-17. On an unchanged assumption about growth in the tax base, only part of this would be expected to affect future years.
- **Corporation tax (CT) receipts** were £0.8 billion higher than expected, reflecting strong cash payments between April and June 2017. Under the new time-shifted accruals basis for CT, all these cash receipts are accrued back to earlier years. The implications of this for future years depend on whether those higher cash receipts imply that previous years' liabilities are being paid off more quickly – i.e. a timing effect – or that the liabilities themselves have been higher than expected – i.e. that the underlying position is stronger, which all else equal would boost the forecast.
- **Central government spending** was £1.9 billion lower than expected, largely reflecting greater-than-expected underspending against departments' plans. Given different pressures on departmental budgets in different years of the Spending Review period, there is no mechanical link between outturns in 2016-17 and the judgements that we would make about future years.

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Partly offsetting those factors, **local authority net borrowing** was £1.8 billion higher than expected, as spending exceeded local revenue by a greater extent than we had assumed, mainly through higher than expected use of prudential borrowing. The implications of this for future years are not yet clear.

**Table A: March 2017 PSNB: outturn versus forecast**

	£ billion		
	March 2017 forecast to April outturn	April to September revision	March 2017 forecast to September outturn
First estimate <sup>1</sup>	52.0	52.0	52.0
Revised outturn	52.0	45.0	45.0
<b>Difference</b>	<b>0.0</b>	<b>-7.0</b>	<b>-7.0</b>
<i>of which:</i>			
<b>Classification and methodological changes<sup>2</sup></b>	-	-1.3	-1.3
<i>of which:</i>			
CG and LA pension schemes	-	-1.0	-1.0
Previously unrecorded income	-	-0.3	-0.3
<b>Revisions to outturn data</b>	<b>0.0</b>	<b>-5.7</b>	<b>-5.7</b>
<i>of which:</i>			
IT and NICs receipts	-1.4	-2.1	-3.5
VAT receipts	1.2	-2.1	-0.9
Corporation tax receipts	-0.6	-0.2	-0.8
Other CG receipts	-0.4	-0.5	-0.9
CG spending	-1.2	-0.6	-1.9
LA net borrowing	2.0	-0.2	1.8
PC net borrowing	0.5	0.1	0.5

Note: This table shows impacts on PSNB, i.e. higher-than-expected receipts reduces net borrowing.

<sup>1</sup> Adjusted for various classification changes that were anticipated in our March 2017 forecast, but have not yet been implemented. Our November 2015 Economic and fiscal outlook discusses some of these items in further detail.

<sup>2</sup> Reflects changes that the ONS included in the Public Sector Finances Statistical Bulletin released in September 2017, as part of wider revisions included in Blue Book 2017. In some cases the distinction between whether these revisions were methodological or classification changes, or other forms of data changes is not clear cut.

## Receipts

- 3.8** Receipts were around £17½ billion above our March 2015 forecast for 2016-17, with nearly two-thirds of the surplus explained by onshore corporation tax (CT). Nearly half that onshore CT surprise reflects a change in the ONS accounting treatment, meaning the like-for-like receipts surplus against forecast was around £12½ billion. The sources of this difference – including stronger-than-expected capital gains tax and VAT receipts – are detailed below. They were partly offset by self-assessment income tax (reflecting continued weakness in the effective tax rate) and interest and dividend receipts (largely reflecting lower-than-expected interest rates) falling short of our forecasts.
- 3.9** The receipts surplus was smaller against our March 2016 forecast, with overall receipts coming in around £9 billion above forecast and the like-for-like difference £4 billion, again reflecting strength in onshore corporation tax, VAT and capital gains tax.

**Table 3.2: 2016-17 receipts forecast differences**

	£ billion					
	Forecast		Outturn	Difference		
	March 2015	March 2016		March 2015	March 2016	
Income tax (gross of tax credits)	182.0	182.1	177.2	-4.7	-4.9	
<i>of which:</i>						
Pay as you earn (PAYE)	153.6	153.4	149.7	-3.9	-3.6	
Self assessment (SA)	29.3	30.2	28.5	-0.8	-1.6	
National insurance contributions	123.9	126.5	125.9	2.1	-0.5	
Value added tax	117.7	120.1	121.6	3.9	1.6	
Business rates	29.0	28.4	29.4	0.4	1.0	
Council tax	28.8	30.1	30.4	1.5	0.3	
Onshore corporation tax (cash)	42.9	43.4	49.2	6.3	5.8	
UK oil and gas revenues (cash)	0.6	-1.1	-0.3	-0.9	0.8	
Capital gains tax and inheritance tax	11.9	11.8	13.2	1.3	1.5	
Stamp duties <sup>1</sup>	15.2	15.9	15.6	0.4	-0.3	
Fuel, alcohol and tobacco duties	47.0	47.7	47.7	0.8	0.0	
Interest and dividends	7.8	5.7	6.0	-1.8	0.3	
Other taxes	53.7	60.2	57.6	3.9	-2.7	
Other receipts	48.1	46.5	47.5	-0.6	1.0	
<b>Like-for-like current receipts<sup>2</sup></b>	<b>708.6</b>	<b>717.3</b>	<b>721.1</b>	<b>12.5</b>	<b>3.8</b>	
Corporation tax accruals adjustment	0.0	0.0	5.1	5.1	5.1	
<b>Current receipts</b>	<b>708.6</b>	<b>717.3</b>	<b>726.2</b>	<b>17.6</b>	<b>8.9</b>	

<sup>1</sup> Excludes Scottish LBTT.

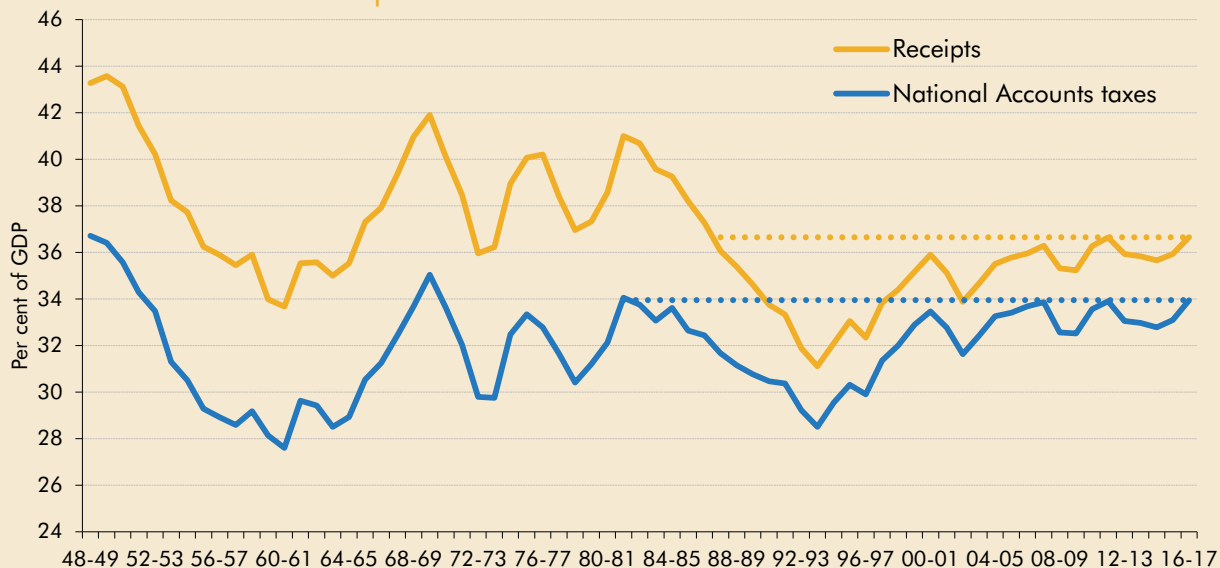
<sup>2</sup> Excludes corporation tax accruals adjustment.

- 3.10** Strong overall receipts growth in 2016-17 took receipts as a share of GDP to their highest since 1986-87. Box 3.2 describes how the composition of the public sector's income has changed over the three decades since receipts were last at the latest share of GDP.

### Box 3.2: The receipts-to-GDP ratio since 1986-87

Public sector receipts rose to 36.7 per cent of GDP in 2016-17, their highest level since 1986-87. National Accounts taxes (which exclude non-tax revenues, such as interest paid on the government's assets and the operating surpluses of public corporations) reached 34.0 per cent of GDP, the highest level since 1981-82. Chart B illustrates these historical trends.

Chart B: Taxes and receipts as a share of GDP



Source: ONS

Chart C shows the different factors that have contributed to the fall and subsequent rise in the receipts-to-GDP ratio since 1986-87. Factors pushing the ratio higher include:

- **VAT receipts** have risen by 2.2 per cent of GDP. This largely reflects policy-driven rises in the effective tax rate: the standard rate of VAT was raised from 15 to 17½ per cent in 1991, cut to 15 per cent in late 2008 to support the economy through the recession, returned to 17½ per cent in 2010 and then raised again to 20 per cent in 2011. A disproportionate rise in the tax base has also helped, with consumer spending rising as a share of GDP by around 3.0 percentage points over the period.
- **National Insurance contributions** have risen by 0.5 per cent of GDP. This is more than explained by largely policy-driven increases in the effective tax rate. Over this period, the main employee rate has risen from 9 to 12 per cent and the employer's rate has risen from 10.45 to 13.8 per cent. Receipts were actually below their 1986-87 level until 2002-03, but moved above it as Budget 2002 rises were implemented in 2003-04. Removing the NICs contracting out rebate boosted receipts by a further 0.3 per cent of GDP in 2016-17. Wages and salaries fell by less than half a per cent of GDP over the period, partly offsetting the contribution from a higher effective tax rate.<sup>a</sup>
- **Onshore corporation tax** receipts have risen by 0.4 per cent of GDP, despite the headline rate having been cut from 35 to 20 per cent. The effect of this lower rate has been offset to some extent by policy changes that restrict the use of reliefs and allowances, increasing the amount of profits subject to tax. Non-oil, non-financial profits have risen by 2.7 per cent of GDP from 2009 to 2016, boosting receipts despite the lower headline tax rate. Some of the rise will reflect the upward trend in incorporations. In 2016-17, receipts topped their

pre-crisis level as a share of GDP for the first time, but remain below the peak they reached in 1989-90.

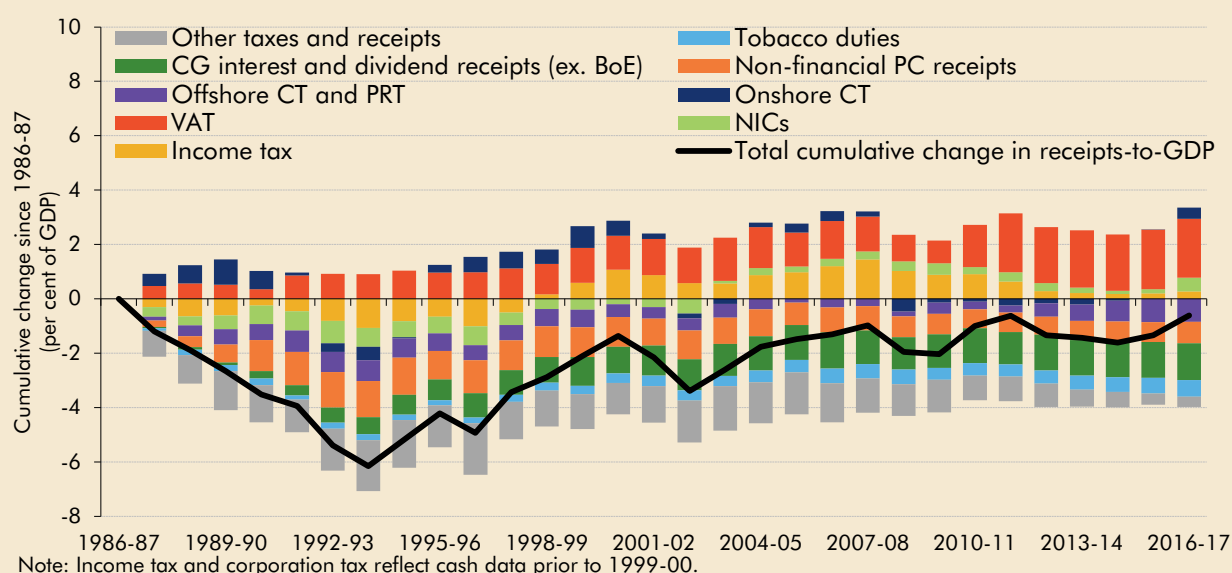
- **Income tax** receipts, although below their recent 2007-08 peak, are 0.3 per cent of GDP higher than in 1986-87. Again, this is explained by a higher effective tax rate, partly reflecting the fact that average earnings have risen faster than the higher rate threshold over the period, so that a rising proportion of earnings have been taxed at the higher rate of income tax. The recent weakness in earnings growth has placed greater downward pressure on income tax than NICs because of its more progressive rate structure.

Partly offsetting those positive contributions to leave total tax receipts 1.5 per cent of GDP higher than in 1986-87 were:

- **Offshore corporation tax and petroleum revenue tax (PRT)** receipts have fallen by 0.8 per cent of GDP. This fall mainly reflects declining oil and gas production from around 2000 onwards, as well as cuts to the main rates of tax. The PRT rate was cut to zero in 2016-17, having been as high as 75 per cent in 1986-87. More recently the drop in oil prices has further reduced receipts.
- **Tobacco duty** receipts have fallen by 0.6 per cent of GDP, reflecting a steady decline in tobacco consumption. The proportion of adults in Great Britain who smoke halved between 1986 and 2016 (from 33 to 16 per cent).

Despite higher tax receipts, overall receipts were 0.6 per cent of GDP lower than in 1986-87. This reflects central government interest and dividend receipts (excluding the intra-public sector receipts from the Bank of England) having fallen by 1.4 per cent of GDP. Interest rates have fallen significantly over the past three decades. For example, Bank Rate averaged 10.4 per cent during 1986-87, but was cut to 0.25 per cent mid-way through 2016-17. And receipts from non-financial public corporations have fallen by 0.8 per cent of GDP. This largely reflects privatisations in the late 1980s and early 1990s, reducing both public sector receipts and public spending.

Chart C: Change in the receipts-to-GDP ratio since 1986-87



<sup>a</sup> Pre-1997 estimates of some income components of GDP consistent with the latest Quarterly National Accounts release were not available at the time of publication. For pre-1997 data, we have created an estimate using the previous vintage of data.

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### Income tax and NICs

**3.11 PAYE income tax and NICs receipts** fell short of our March 2015 forecast by £1.8 billion. That shortfall is more than explained by two factors:

- **Labour market developments** explain nearly two-thirds of the shortfall. Growth in average earnings was again weaker than expected, reducing receipts by around £3½ billion. Employment growth was stronger than expected, offsetting around £2½ billion of the earnings weakness.
- **Policy changes in the July 2015 Budget.** These include 2016-17 increases in the personal allowance (to £11,000), the higher rate threshold (to £43,000) and the NICs employment allowance (to £3,000). The original costings of the July 2015 Budget measures estimated that they would together reduce receipts by around £1½ billion in 2016-17, with the personal allowance rise accounting for around three quarters of that.

**3.12** Relative to our March 2016 forecast, receipts fell short of our forecast by £4.2 billion. The effect of weaker earnings growth was offset by strength in employment. Around half this shortfall relates to the starting point for the forecast, as we overestimated PAYE and NIC1 receipts in 2015-16 by £2.0 billion. While our March 2016 forecast was produced close to the end of the 2015-16 fiscal year, we did not have information on accrued receipts in February and March. As these are large bonus-paying months, receipts tend to be more volatile than the rest of the year. The surprise in February and March 2016 receipts reflected weaker-than-expected bonuses in both the financial and non-financial sectors. Changes in the effective tax rate explain most of the remaining shortfall.

**3.13 Self-assessment (SA) income tax receipts** in 2016-17 also fell short of our March 2015 and March 2016 forecasts – by £0.8 and £1.6 billion respectively. A combination of subsequent policy changes with uncertain effects and the assumptions factored into our forecasting model appear to explain the bulk of the difference.

**3.14** On the policy side, the July 2015 Budget reforms to the taxation of individual dividend income were a source of upside surprise in 2016-17. The reform included raising the basic, higher and additional rates by 7.5 percentage points with effect from April 2016 and introducing a tax-free dividend allowance. As has been the case with other recent measures announced ahead of implementation, we expected taxpayers to bring forward dividend income to before April 2016 to have it taxed at the lower existing rates. Since the tax is paid through SA with a lag, that would boost 2016-17 receipts at the expense of lower receipts in 2017-18 and 2018-19. We assumed that £7.6 billion of dividend income (worth £2.6 billion of dividend tax) would be brought forward. Analysis of SA tax return data presented in our March 2017 *EFO* suggested that in fact £10.7 billion of dividend income (worth £4.0 billion of dividend tax) had been brought forward.<sup>5</sup> Adjusting our March 2015 and March

<sup>5</sup> See Box 4.3 of our March 2017 *EFO*.

2016 forecasts for this policy costing (and the subsequent revision to it) increases the receipts shortfalls to £4.8 and £3.0 billion respectively.

- 3.15 The bulk of these shortfalls appear to reflect continued weakness in the effective tax rate paid on SA liabilities. Initial analysis of HMRC tax return data suggests that a continued shift in the self-employment income distribution towards the bottom end is behind this weakness. Growth in self-employment among unincorporated businesses and sole traders who pay tax via SA seems to be concentrated among lower-income individuals, while the trend towards incorporation among those with higher incomes reduces the amount of tax they pay on a given income and shifts much of it to the corporation tax system.
- 3.16 Our SA receipts forecasts include the estimated effect of several anti-avoidance measures. In our latest evaluation of the relevant costings, we have found that outturn yield has fallen short of expectation more often than not.<sup>6</sup> This has contributed to the overall shortfalls relative to our March 2015 and March 2016 forecasts.
- 3.17 Our SA forecast model uses a time-series econometric approach to generate an effective tax rate which is then applied to different sources of SA income. We then adjust the results to try to capture recent trends and policy effects not reflected in the model. Due to the number of policies announced in recent years, the uncertain effects of above-inflation increases in the personal allowance and higher rate threshold interacting with changes in the self-employment earnings distribution, and income shifting caused by pre-announced policy changes, these assumptions have been a repeated source of fiscal forecasting differences. This approach no longer seems satisfactory and we have prioritised this component of the SA model in our review of fiscal forecasting models, as detailed in Chapter 4.
- 3.18 Other income tax receipts were £0.1 billion below our March 2015 forecast and £0.4 billion higher than we forecast in March 2016. This reflects large offsetting differences. The adjustment to align outturn data with the latest HMRC trust statement added £1.1 billion to 2016-17 receipts, but this is largely offset by shortfalls in other receipts streams.

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<sup>6</sup> For more detail see *Working Paper No.11: Evaluation of HMRC anti-avoidance and operational measures* available on our website.



Table 3.3: 2016-17 income tax and NICs forecasts

	£ billion					
	Forecast	Outturn	Difference	of which:		
				Policy changes	Economic factors	Fiscal forecasting difference
<b>March 2015 forecast</b>						
Income tax (gross of tax credits)	182.0	177.2	-4.7	1.9	0.2	-6.9
of which:						
Pay as you earn (PAYE)	153.6	149.7	-3.9	-1.1	-0.8	-2.0
Self assessment (SA)	29.3	28.5	-0.8	2.7	1.2	-4.7
National insurance contributions	123.9	125.9	2.1	-0.3	-0.6	2.9
<b>March 2016 forecast</b>						
Income tax (gross of tax credits)	182.1	177.2	-4.9	0.0	-0.1	-4.8
of which:						
Pay as you earn (PAYE)	153.4	149.7	-3.6	0.0	-0.1	-3.6
Self assessment (SA)	30.2	28.5	-1.6	0.0	0.0	-1.6
National insurance contributions	126.5	125.9	-0.5	0.0	-0.1	-0.4

## VAT

3.19 Relative to our March 2015 forecast, VAT receipts were £3.9 billion higher despite weaker-than-expected growth in consumer spending. This reflects two key factors:

- The **composition of household spending** has been more favourable for VAT receipts than we expected, boosting them by £1.6 billion. The latest HMRC analysis suggests the 'standard-rated share' (SRS) of household spending has risen by nearly 1 percentage point over the past two years, compared with our assumption of a stable share over that period. This largely reflects strong growth in spending on durable goods (particularly motor vehicles). In our March 2017 forecast, we moved to a new SRS model that places more weight on trends in spending on durable goods.
- The error in our **VAT deductions** forecast that was identified in our 2015 FER and corrected in our November 2015 forecast explains £1.6 billion of the surplus. (Exploring fiscal forecast differences for our 2015 FER revealed that the VAT deductions model was using historically derived growth rates rather than reflecting cuts to public spending that reduce deductions relating to the government sector. This had resulted in us over-forecasting deductions and thus under-forecasting receipts.)

3.20 Policy changes also contributed to the surplus, including the boost to VAT receipts on car purchases brought forward ahead of the April 2017 vehicle excise duty reforms that were pre-announced in the July 2015 Budget. VAT receipts were also higher than expected in 2014-15, the base year from which this forecast applied expected receipts growth.

3.21 Relative to our March 2016 forecast, there was a smaller surplus of £1.6 billion. This reflects similar factors, in particular a £1.0 billion boost from a higher-than-expected standard-rated share. By this forecast, the VAT deductions model had been corrected, so it was no longer a source of underestimate in our VAT receipts forecast.

Table 3.4: 2016-17 VAT forecasts

	£ billion					
	Forecast	Outturn	Difference	of which:		
				Policy changes	Economic factors	Fiscal forecasting difference
March 2015 forecast	117.7	121.6	3.9	0.4	0.3	3.2
March 2016 forecast	120.1	121.6	1.6	0.0	-0.1	1.6

### Onshore corporation tax

- 3.22** On a simple comparison of forecasts and outturn, onshore corporation tax (CT) receipts exceeded our March 2015 and March 2016 forecasts by £10.6 and £10.1 billion respectively. On a like-for-like basis, the differences, while still large, fall to £6.3 and £5.8 billion respectively. That is because the ONS has moved from recording CT receipts in the public finances data on a cash basis (when the tax is received by HMRC) to using a time-shifted cash basis that proxies for a true accruals basis (moving the scoring closer to when the activity generating the CT liability was generated). This change was implemented in February 2017 and we incorporated it in our March 2017 forecast.
- 3.23** This accounting treatment change boosted measured onshore CT receipts by £4.3 billion in 2016-17, reflecting the fact that the strong growth in cash receipts in 2017 (largely based on HMRC's monthly profiling of our latest forecasts) is accrued back to earlier periods. To allow for like-for-like comparisons between the forecasts being assessed in this *FER* and the latest outturns, we have focused on our cash forecasts and presented this accounting treatment change separately from the other components of the forecast difference.
- 3.24** The large like-for-like surpluses against our March 2015 and March 2016 forecasts reflect the fact that cash onshore CT receipts in 2016-17 increased by 12.6 per cent on a year earlier, well above our forecasts of 1.5 and *minus* 0.5 per cent respectively. Several factors contributed to these higher-than-expected CT receipts:
- Relative to our March 2015 forecast, the effect of **subsequent policy changes** explains £0.8 billion of the surplus. These include the Budget 2016 measure to further restrict the amount of losses banks can use to offset against their taxable profits. Policy changes had no effect relative to our March 2016 forecast.
  - If we had known the outturns for the **economic determinants** of CT receipts, then that would have boosted our March 2015 forecast by £0.9 billion and our March 2016 forecast by £1.4 billion. In particular, that reflects higher-than-expected non-financial company profits and lower-than-expected business investment (which reduces the value of capital allowances available to offset against taxable profits).
  - A higher **2014-15 starting point** relative to our March 2015 forecast, when we had access to outturn data up to January 2015 and some administrative data for February 2015. By the time of our July 2015 forecast, the receipts estimate for 2014-15 was already £0.5 billion higher than our previous forecast. On the latest estimates, it is

## The public finances

£0.7 billion higher. Adjusting for that higher starting point would have boosted our forecast for 2016-17 receipts by around £0.7 billion. This effect is small relative to our March 2016 forecast.

- **Payment timing assumptions.** The speed at which companies pay off their liabilities for a particular year is an important forecast assumption. Companies appear to have paid a higher proportion of their liability in instalment payments before the end of 2016-17 than we expected, boosting cash receipts by £1.2 billion relative to our March 2015 forecast and £1.0 billion relative to March 2016.
- **Life assurance receipts** were £0.4 billion higher than our March 2015 forecast, after accounting for policy changes and outturn economic determinants, and £0.8 billion higher than our March 2016 forecast. These differences suggest there is a problem with the way our model factors in the effect of bond price movements on life assurance companies' tax liabilities. We are reviewing this with HMRC analysts.
- Autumn Statement 2015 announced a **special 45 per cent corporation tax rate on 'restitution payments'** resulting from litigation against HMRC. The original costing – factored into both our March 2015 and March 2016 forecasts – expected this to raise £55 million in 2016-17, but the latest analysis from HMRC suggests that it actually raised £0.6 billion. Interim litigation payouts made by HMRC in 2016-17 were substantially higher than expected.

**3.25** These factors together explain around two-thirds of the 'like-for-like' surplus against our March 2015 and March 2016 forecasts. The remainder is likely to reflect movements in taxable income and deductions in 2016-17, although HMRC will only publish data on these in August 2018, so we will not have a full picture until then. Analysis of the 2015-16 data suggests that the use of group relief has fallen faster than we expected, which may be a factor in this year's surplus.

**3.26** In a new briefing paper on forecast evaluations, we have used our March 2015 onshore CT forecast to illustrate the steps we take when analysing forecast differences. Annex A of the briefing paper, available on our website, provides a more detailed step-by-step guide to understanding the differences summarised in Table 3.5.

**Table 3.5: 2016-17 onshore corporation tax forecasts**

	£ billion						
	Forecast	Outturn	Difference	of which:			
				Accounting treatment change	Policy changes	Economic factors	Fiscal forecasting difference
March 2015 forecast	42.9	53.5	10.6	4.3	0.8	0.9	4.7
March 2016 forecast	43.4	53.5	10.1	4.3	0.0	1.4	4.4

## Capital taxes

- 3.27 Capital gains tax (CGT)** receipts in 2016-17 outperformed both our March 2015 and March 2016 forecasts, increasing by 19 per cent on the previous year relative to forecasts of 12 per cent and little change respectively. This was despite a 5 per cent fall in the FTSE All-share index in 2015-16 – the year in which the relevant CGT liabilities were generated, since CGT is paid in the financial year following the period when the disposal took place. Initial HMRC analysis suggests that around two-thirds of CGT receipts in 2016-17 related to the sale of shares and equity. Within that, around two-thirds came from unlisted company equity rather than the major (and often multinational) companies listed in the FTSE.
- 3.28 Inheritance tax** receipts were £0.2 billion higher than expected in our March 2015 forecast. This largely reflects higher-than-expected deaths in 2016-17 (at 609,000 versus the 548,000 we had assumed on the basis of ONS projections). Relative to our March 2016 forecast, receipts were £0.1 billion higher than expected. This partly reflects strong equity price growth in 2016-17.

## Stamp taxes

- 3.29 Stamp duty land tax (SDLT)** receipts were close to our March 2015 forecast, as subsequent policy changes offset a shortfall in our underlying forecast. Receipts were £0.9 billion lower than our March 2016 forecast. The underlying forecasting shortfalls largely reflected weakness in the commercial sector, which reflected uncertainty in the run-up to and following the EU referendum and possibly a larger-than-expected behavioural response to the commercial SDLT ‘slab-to-slice’ reform announced in March 2016.
- 3.30** These were partly offset by higher-than-expected receipts from the additional properties surcharge that was announced in November 2015 to take effect from April 2016. This was another policy announcement that prompted taxpayers to shift the timing of activity – in this case property transactions – to avoid being subject to the forthcoming tax rise. This boosted 2015-16 receipts at the expense of 2016-17. At the time we assumed that around 10,000 transactions would be brought forward, reducing receipts by £50 million. In the event, we estimate around 40,000 transactions were brought forward, reducing 2016-17 receipts by a further £250 million.<sup>7</sup> We have treated this as a fiscal forecasting difference. Despite this forestalling, the measure has raised much more than originally expected – our latest estimate for 2016-17 is £1.6 billion compared to £0.7 billion in the original costing. However, taxpayers can claim a refund if they sell their main residence within 36 months, so we will not know the final net impact in 2016-17 for nearly three years.
- 3.31** While **stamp duty on shares** is a relatively small receipts line, it has recently been subject to relatively large fiscal forecasting differences – of 18 and 12 per cent relative to our March 2015 and March 2016 forecasts respectively. One reason for this has been the higher-than-expected yield from the ‘schemes of arrangement’ measure that removed the option for companies to cancel and reissue shares during a takeover, avoiding a stamp duty liability,

<sup>7</sup> It should be noted that the magnitude of forestalling itself is subject to considerable uncertainty. See Mathews (2016): *Working paper No. 10: Forestalling ahead of property tax changes*.

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rather than simply transferring them. A number of very large takeovers have been affected, adding around £0.4 billion to 2016-17 receipts relative to these forecasts.

Table 3.6: 2016-17 capital and stamp taxes forecasts

	£ billion					
	Forecast	Outturn	Difference	of which:		
				Policy changes	Economic factors	Fiscal forecasting difference
<b>March 2015 forecast</b>						
Stamp duty land tax <sup>1</sup>	11.8	11.9	0.1	1.1	0.0	-1.0
Stamp duty on shares	3.4	3.7	0.3	0.0	-0.3	0.6
Capital gains tax	7.3	8.4	1.1	0.2	-1.0	1.9
Inheritance tax	4.6	4.8	0.2	0.0	0.0	0.2
<b>March 2016 forecast</b>						
Stamp duty land tax <sup>1</sup>	12.9	11.9	-0.9	0.0	-0.4	-0.6
Stamp duty on shares	3.0	3.7	0.7	0.0	0.3	0.4
Capital gains tax	7.0	8.4	1.4	0.0	0.2	1.2
Inheritance tax	4.8	4.8	0.1	0.0	0.2	-0.1

<sup>1</sup> Excludes Scottish LBTT.

## Fuel, alcohol and tobacco duties

- 3.32 Fuel duties** outperformed both our March 2015 and March 2016 forecasts, despite the cancellation of the planned April 2016 RPI-linked rise at Budget 2016 and ongoing improvements in vehicle efficiency. This appears to be due to rising demand for fuel from light commercial vehicles (LCVs), where mileages have increased sharply, probably reflecting deliveries of goods purchased online. Over the past five years, LCV mileage driven has risen by 21 per cent, whereas car and taxi mileage increased by just 5 per cent.<sup>8</sup>
- 3.33** Our forecasts are based on a model that relates miles driven to GDP growth and the cost of driving. In our November 2016 forecast, we revised the parameters in this model to increase the sensitivity of miles driven to GDP growth, as a proxy for the effect of increased mileage delivering online goods purchases. This added increasing amounts to receipts relative to our March 2016 forecast, reaching around £1 billion a year by 2020-21.
- 3.34 Tobacco duties** were weaker than expected in 2016-17, reflecting a faster-than-expected fall in taxable consumption – known as ‘clearances’. This may reflect a faster decline in underlying consumption as well as one-off effects relating to the introduction of several new regulations in early 2017 (such as outlawing smaller cigarette and hand-rolling tobacco pack sizes and the introduction of plain packaging). In light of these recent trends, we moved to assuming a steeper downward trend in clearances in our November 2016 forecast (revising it from 3 to 4 per cent a year). This took increasing amounts off receipts relative to our March 2016 forecast, reaching £0.5 billion a year by 2020-21.

<sup>8</sup> Department for Transport, *Provisional Road Traffic Estimates: Great Britain July 2016 – June 2017*, September 2017.

3.35 **Alcohol duties** were a little higher than expected in 2016-17 relative to both forecasts. This reflected stronger-than-expected consumption of products liable to spirit and beer duty, in part due to the recent popularity of gin and craft beer.

Table 3.7: 2016-17 fuel, tobacco and alcohol duties forecasts

	£ billion					
	Forecast	Outturn	Difference	of which:		
				Policy changes	Economic factors	Fiscal forecasting difference
<b>March 2015 forecast</b>						
Fuel duties	27.2	27.9	0.8	-0.4	0.3	0.9
Tobacco duties	9.0	8.7	-0.3	0.0	0.0	-0.3
Alcohol duties	10.8	11.1	0.3	-0.1	0.0	0.4
<b>March 2016 forecast</b>						
Fuel duties	27.6	27.9	0.3	0.0	-0.2	0.5
Tobacco duties	9.2	8.7	-0.5	0.0	0.0	-0.5
Alcohol duties	10.9	11.1	0.2	0.0	0.0	0.1

### Other receipts

3.36 Other notable forecast differences in 2016-17 include:

- **North Sea oil and gas revenues** in 2016-17 were close to zero, as repayments of petroleum revenue tax offset net corporation tax payments. This fell short of the modest revenues expected in March 2015, but outperformed our March 2016 forecast, which expected repayments to exceed payments. The differences largely reflect gyrations in the oil price and associated fluctuations in the oil price futures that we use as conditioning assumptions for the first two years of each forecast.
- **Business rates** receipts were higher than expected (by £0.4 and £1.0 billion versus our March 2015 and March 2016 forecasts respectively). In October 2016, the ONS revised outturn data higher for recent years, in particular higher estimates of Scottish business rates were included. This helps explain the positive fiscal forecasting difference relative to both forecasts.
- **Council tax** receipts were £1.5 billion above our March 2015 forecast but only £0.3 billion above our March 2016 forecast.<sup>9</sup> Part of that reflects the £0.4 billion boost to council tax receipts from the Spending Review 2015 decision to allow some local authorities to raise council tax rates more quickly to meet some of the costs associated with adult social care and policing. This is discussed in more detail in the local authority spending section below.
- Relative to our March 2015 forecast, **insurance premium tax (IPT)** receipts were boosted by £1.5 billion as a result of successive policy measures that increased the

<sup>9</sup> Differences in the council tax forecast do not fully reconcile to differences in local authority council tax receipts (see Table 3.10) because they are measured on a different basis.

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standard rate from 6 to 10 per cent by October 2016 (based on the costing estimates made at the time). The standard rate was raised again to 12 per cent in June 2017.

- We include all **environmental levies** in our forecast where the ONS has announced classification decisions, but some are yet to appear in ONS outturn data. We treat these differences between forecast and outturn as classification effects in the summary tables shown in Annex A. The larger levies (such as feed-in tariffs) have a neutral effect on the public finances, increasing both receipts and spending by the same amounts.
- **Scottish taxes** cover receipts from land and buildings transaction tax (LBTT) and Scottish landfill tax that were introduced by Scottish Parliament from April 2015. These came in close to forecast, with the tables in Annex A showing no differences large enough to round to £0.1 billion. We discuss our forecasts for Scottish taxes in detail in a *Devolved taxes forecast* publication alongside each *EFO*. The Scottish Fiscal Commission – our equivalent in Scotland – has recently taken responsibility for forecasting these taxes for the Scottish Government. It has published its own detailed evaluation of the Scottish Government’s forecasts of these taxes for 2016-17.<sup>10</sup>
- **Interest and dividend receipts** came in £1.8 billion below our March 2015 forecast. £1.0 billion of this reflects economic factors. Notably, Bank Rate was 0.7 percentage points lower than implied by market expectations at the time of our forecast.

## Spending

**3.37** In cash terms, our spending forecasts have been far more stable than our receipts forecasts – and the aggregate forecast differences have tended to be smaller. That in part reflects the fact that much public spending is insulated from short-run economic fluctuations. One key exception is debt interest, which is sensitive to changes in inflation, interest rates and the amount of gilts held in the Bank of England’s Asset Purchase Facility, which returns much of the interest received on them to the Exchequer. Policy changes can also be significant, as has been the case this year.

**3.38** Table 3.8 summarises the sources of spending forecast differences relative to our March 2015 and March 2016 forecasts for 2016-17:

- **Relative to our March 2015 forecast:** the £20.0 billion underestimate is dominated by the large increase in departmental spending announced in the Conservative Government’s post-election July 2015 Budget relative to the sharp fall that had been pencilled into the Coalition’s final Budget in March 2015. Local authorities’ self-financed current expenditure was also much higher than expected as they borrowed more than we expected and drew down reserves to support higher spending, in contrast to our assumption that, as in preceding years, they would continue to constrain spending to build up their reserves. These upside surprises were partly offset by lower-than-expected spending on debt interest (due to lower interest rates) and

<sup>10</sup> *Forecast evaluation report: September 2017*, Scottish Fiscal Commission, 2017.

welfare spending (due to policy measures and lower-than-expected tax credits and pensioner benefits caseloads, more than offsetting higher incapacity and disability benefits spending).

- **Relative to our March 2016 forecast:** the £2.0 billion overestimate reflects a number of offsetting factors. Local authorities' spending was higher than expected for the same reasons noted above, while expenditure transfers to the EU were lower than expected due to timing effects that pushed more of calendar year 2017 contributions into 2017-18 than we had assumed. Personal tax credits spending was again lower than expected.

Table 3.8: 2016-17 spending forecast differences

	£ billion				
	Forecast		Outturn	Difference	
	March 2015	March 2016		March 2015	March 2016
PSCE in RDEL	293.2	313.8	312.5	19.3	-1.3
Locally financed current expenditure	40.0	40.8	45.1	5.1	4.3
Welfare spending	219.5	218.3	216.9	-2.6	-1.3
Net debt interest payments	40.4	35.4	35.5	-4.9	0.1
Expenditure transfers to EU institutions	9.4	11.8	8.8	-0.6	-3.0
Net public service pension payments	11.2	11.2	11.2	-0.1	0.0
Other current expenditure	60.7	63.2	62.6	1.9	-0.6
<b>Current expenditure</b>	<b>674.4</b>	<b>694.5</b>	<b>692.6</b>	<b>18.2</b>	<b>-1.9</b>
PSGI in CDEL	45.4	46.0	45.8	0.4	-0.2
Other capital expenditure	31.4	32.8	32.8	1.4	0.1
<b>Gross investment</b>	<b>76.8</b>	<b>78.8</b>	<b>78.6</b>	<b>1.8</b>	<b>-0.1</b>
Less depreciation	42.2	41.7	40.8	-1.4	-0.9
<b>Net investment</b>	<b>34.6</b>	<b>37.1</b>	<b>37.9</b>	<b>3.2</b>	<b>0.8</b>
<b>Total spending</b>	<b>751.3</b>	<b>773.3</b>	<b>771.3</b>	<b>20.0</b>	<b>-2.0</b>

### Departmental expenditure limits (DELs)

3.39 The Government sets departmental current and capital spending budgets at Spending Reviews – these budgets are known as departmental expenditure limits (DELs) and are split between current (or resource) spending (RDEL) and capital spending (CDEL). These plans tend to be adjusted in subsequent Budgets and Autumn Statements. Departments typically underspend against the limits they have been set, so that actual DEL spending – which is what matters for our borrowing forecast – is usually below the final plans. Our main forecast judgement in relation to DEL spending is an assumption about the extent of underspending against plans in the years for which they have been set.

3.40 In evaluating our DEL spending forecasts, we first remove the effect of classification changes. We then calculate the difference between our underspend assumptions and an 'outturn' relative to plans as they stood after the Autumn Statement of the year in question.<sup>11</sup> This leaves a residual that reflects policy changes to plans on a broadly like-for-like basis.

<sup>11</sup> For 2016-17, we show differences relative to plans set out in the Treasury's Public Expenditure Statistical Analyses (PESA) 2016 document, adjusted for DEL policy measures announced in Autumn Statement 2016.



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This ordering is different to the rest of our evaluation work, where policy effects are calculated first and fiscal forecasting differences inferred by residual.

- 3.41 A number of relatively small classification changes, most of which are neutral for spending overall, are relevant to our March 2015 and March 2016 forecasts. Some previously unaccounted for income (such as fees for services, which are treated as negative DEL spending) has been included in the public finances data and has reduced RDEL spending and PSNB. Larger classification changes have affected earlier forecasts, as detailed in the tables in Annex A.
- 3.42 Abstracting from these classification changes, DEL spending in 2016-17 was much higher than our March 2015 forecast (due to subsequent policy changes) and a little lower than our March 2016 forecast (due to greater-than-expected underspending).
- 3.43 Our March 2015 forecast preceded the 2015 General Election, at which point detailed DEL plans had not been set out beyond 2015-16. Our DEL spending forecast was derived by residual from the Coalition Government's policy assumption on total spending and our forecast for annually managed expenditure (AME). On that basis, the Coalition's final Budget would have required a £14.8 billion year-on-year cash-terms cut in RDEL spending in 2016-17 (around 6 per cent in real terms) and allowed CDEL spending to rise by £0.5 billion in cash terms on the previous year (roughly flat in real terms).
- 3.44 In the post-election Budget of July 2015, the new Conservative Government raised the path for DEL spending significantly. In the Spending Review that followed in November 2015, it increased DEL spending further in every year covered by the plans. At this event, RDEL spending increased by £5.7 billion in 2016-17 (roughly flat in real terms) and CDEL spending by £3.2 billion (a real terms rise of 7 per cent).
- 3.45 In March 2015, we did not present an illustrative path for implied DEL plans and underspending relative to them that would have been consistent with the forecast path for DEL spending. Other than classification changes, we have therefore shown all the £19.7 billion difference in DEL spending as the result of policy changes. Even if we had produced an illustrative underspend assumption that could be compared with the outturn, it would undoubtedly have been swamped by the size of the policy change.
- 3.46 Our March 2016 forecast reflected the new departmental budgets for 2016-17 that had been set in the Spending Review. We assumed departments would underspend these plans by £2.5 billion (comprising £0.5 billion versus RDEL plans and £2.0 billion versus CDEL). The latest data suggest that they underspent by £5.0 billion in total, with spending a much larger-than-expected £3.7 billion below RDEL plans but only a £1.3 billion below CDEL plans. Underestimating underspending explains the majority of the £1.5 billion overestimate of total DEL spending. Subsequent policy changes largely shifted planned spending between current and capital, notably for the Department of Health.

Table 3.9: 2016-17 DEL forecast differences

	Forecast	Outturn	Difference	£ billion			
				of which:			
				Classification changes	Policy changes	Economic factors	Fiscal forecasting difference
<b>March 2015 forecast</b>							
TME in DEL	338.6	358.3	19.7	-0.3	20.0	0.0	0.0
<i>of which:</i>							
PSCE in RDEL	293.2	312.5	19.3	0.0	19.3	0.0	0.0
PSGI in CDEL	45.4	45.8	0.4	-0.3	0.7	0.0	0.0
<b>March 2016 forecast</b>							
TME in DEL	359.8	358.3	-1.5	0.2	0.8	0.0	-2.5
<i>of which:</i>							
PSCE in RDEL	313.8	312.5	-1.3	0.2	1.7	0.0	-3.2
PSGI in CDEL	46.0	45.8	-0.2	0.0	-0.9	0.0	0.7

### Locally financed current and capital expenditure

- 3.47 Table 3.10 shows that we underestimated local authorities' locally financed current and capital expenditure by substantial amounts in both our March 2015 and March 2016 forecasts. With only small effects from subsequent policy announcements, these differences almost entirely reflect fiscal forecasting differences related to the assumptions underpinning our forecasts. The table breaks down the differences by the source of local finance.
- 3.48 For **local authorities' locally financed current spending**, it is important to distinguish between differences that relate to forecasting the income streams that finance this spending, such as council tax and retained business rates, and those that relate to our assumptions about how much authorities will spend relative to that income, which are embodied in our assumptions about their use of current reserves or repayment of debt. It is only spending relative to income that affects net borrowing, so in our forecasting framework we place particular emphasis on understanding and evaluating the evolution of reserves and debt repayments, and the underlying drivers of those changes.
- 3.49 Our March 2015 and March 2016 forecasts underestimated self-financed current expenditure by £5.1 and £4.3 billion respectively. Within those overall differences:
- £3.2 and £2.9 billion reflects higher-than-expected spending relative to income, from local authorities' use of their **current reserves and repayment of debt**, implying higher public sector net borrowing. Our earlier forecasts assumed that local authorities would ease the downward pressure on their spending from tighter financial settlements by drawing down reserves. This was consistent with local authorities' own budgets. But they surprised us repeatedly by spending less than budgeted and thereby adding to reserves. Our March 2015 and March 2016 forecasts both assumed that reserves would continue to build up, more so in March 2016, although both forecasts assumed that this build-up would cease within the forecast horizon. In fact, data released since these forecasts suggest that the trend was reversed in 2015-16, when reserves in aggregate were drawn down for the first time since 2009-10 and by £0.4 billion in

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total. Provisional outturn data for current spending in 2016-17 show that English and Scottish local authorities drew down a much larger £1.7 billion from their reserves. This accounts for around £2½ billion of the forecast difference relative to both forecasts. While the reserves drawdown exceeded our forecasts, debt repayments were lower than forecast, which increased spending and borrowing by £0.8 and £0.4 billion relative to our March 2015 and March 2016 forecasts respectively.

- £1.1 and £0.8 billion reflects higher-than-expected income **from council tax and retained business rates** financing higher expenditure (implying no effect on public sector net borrowing). Local authorities' council tax income was higher than expected, particularly relative to our March 2015 forecast. At Autumn Statement 2015, local authorities' spending power was increased by giving them flexibility to raise council tax further to finance adult social care and police services. This was expected to add £0.4 billion to spending power in 2016-17. Even after allowing for that, our March 2015 forecast underestimated council tax revenue by £1.0 billion (a larger-than-average difference, driven largely by higher council tax base growth, which we reflected in subsequent forecasts).
- In both forecasts we also overestimated the amount of **capital expenditure that local authorities would finance from their revenue accounts**. This meant that, for a given income, local authorities' current spending was higher than expected and their capital spending was lower by an offsetting amount. This accounted for £0.6 and £0.4 billion of the higher current spending relative to March 2015 and March 2016 respectively.

**3.50** Our March 2017 forecast reflected the more recent data on local authorities' net current expenditure and the latest sector intelligence by forecasting a drawdown of reserves in 2016-17, although the provisional outturn is higher than this forecast predicted. We will be exploring the drivers and forecast implications of the latest data ahead of our forthcoming November forecast. Initial analysis suggests that social care spending pressures (which relate to both adults and children) may have been a contributing factor: English local authorities with social care responsibilities drew down £1.4 billion from their reserves while those without such responsibilities increased them by £0.2 billion.

**3.51** Table 3.10 shows that we also underestimated **local authorities' locally financed capital spending** in both forecasts, by £0.7 and £1.9 billion respectively. This was despite there being less capital spending financed from revenue accounts. Within those differences:

- **Prudential borrowing** was much higher than expected in 2016-17. This accounts for £2.7 and £2.8 billion of the difference relative to each forecast. This was flagged as a potential risk in our *Fiscal risks report* in July, following reports that some of this borrowing was being used for commercial property investments rather than activities directly related to local authorities' provision of public services.
- The additional capital spending was reduced by an offsetting error on the adjustment that we make to switch spending between sectors for the **net capital spending of local authorities' Housing Revenue Accounts (HRAs)**. HRAs are treated as public corporations

in the National Accounts, and so we switch their net capital spending between the local authority and public corporation sectors in our forecast. We underestimated this spending in 2016-17 by about £0.6 billion in both forecasts, which reduced our overall forecast difference on local authority self-financed capital spending but increased it for public corporations' capital spending.

**Table 3.10: 2016-17 locally financed current expenditure forecast differences**

	£ billion		
	Forecast	Outturn	Difference
<b>March 2015 forecast</b>			
<b>Locally financed current expenditure</b>	<b>40.0</b>	<b>45.1</b>	<b>5.1</b>
<i>of which:</i>			
Net use of current reserves	-0.7	1.7	2.4
Funds set aside to repay debt	-3.2	-2.4	0.8
Council tax	28.2	29.5	1.3
Retained business rates	15.7	15.5	-0.3
Other <sup>1</sup>	-0.1	0.8	0.9
<b>Locally financed capital expenditure</b>	<b>8.1</b>	<b>8.8</b>	<b>0.7</b>
<i>of which:</i>			
Prudential borrowing	5.6	8.3	2.7
Adjustment to remove HRA net capital spending	-2.6	-3.2	-0.6
Other <sup>1</sup>	5.1	3.7	-1.3
<b>March 2016 forecast</b>			
<b>Locally financed current expenditure</b>	<b>40.8</b>	<b>45.1</b>	<b>4.3</b>
<i>of which:</i>			
Net use of current reserves	-0.8	1.7	2.5
Funds set aside to repay debt	-2.8	-2.4	0.4
Council tax	29.4	29.5	0.1
Retained business rates	14.8	15.5	0.7
Other <sup>1</sup>	-3.4	0.1	3.5
<b>Locally financed capital expenditure</b>	<b>6.9</b>	<b>8.8</b>	<b>1.9</b>
<i>of which:</i>			
Prudential borrowing	5.6	8.3	2.8
Adjustment to remove HRA net capital spending	-2.7	-3.2	-0.5
Other <sup>1</sup>	4.0	3.7	-0.3

<sup>1</sup> Includes capital expenditure financed from local authorities' revenue accounts, which increases local authorities' capital expenditure and reduces their current expenditure by offsetting amounts.

### Welfare cap and other welfare spending

- 3.52** Total welfare spending was lower than we forecast in both March 2015 and March 2016. Unpicking the precise sources of these forecast differences is made more challenging by the fact that our forecasts include estimates of the marginal effect of universal credit (UC) relative to the existing benefits and tax credits systems, whereas all spending in outturn is on a full-cost basis. But since UC spending largely offsets spending on existing benefits in 2016-17, this does not alter the broad explanations of the £2.6 and £1.3 billion forecast differences for March 2015 and March 2016 respectively.
- 3.53** In both cases, the main source of difference was spending subject to the welfare cap. Our March 2015 forecast was made before the Conservative Government's announcement of

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large cuts in welfare spending in the July 2015 Budget, some of which were reversed before implementation in the subsequent Autumn Statement. Even so, the original estimates of policy changes announced after our March 2015 forecast account for £2.5 billion of the forecast difference. The remaining fiscal forecasting difference reflects a number of partly offsetting factors, with spending on incapacity and disability benefits higher than expected but spending on tax credits significantly lower than expected. Relative to our March 2016 forecast, the fiscal forecasting difference shows a larger unexpected shortfall in spending. The same partly offsetting factors were at play but balanced differently because we had revised up our incapacity and disability benefits forecasts by then.

- 3.54** Tax credits spending has been consistently lower than our recent forecasts and we have been exploring the source of these differences for some time. Relative to our March 2015 and March 2016 forecasts, the shortfalls were £2.3 and £1.1 billion respectively. Around £½ billion reflects an overestimate of net tax credit overpayments in both forecasts. The methodology used here has already been reviewed and refined. Another £½ billion reflects lower-than-expected caseloads, mainly due to a sharply declining number of new claimants, where higher-than-forecast earnings among the relevant population led to fewer awards. This issue remains under review for our November forecast. The out-of-work caseload has also been affected by the faster-than-expected decline in unemployment.
- 3.55** Spending outside the welfare cap was closer to our forecasts. For March 2015 in particular this reflected offsetting sources of forecast difference, as state pensions spending was affected by higher-than-expected triple-lock uprating but a lower-than-expected caseload due to a higher-than-expected number of deaths.

**Table 3.11: 2016-17 welfare spending forecast difference**

	Forecast	Outturn	Difference	£ billion			
				of which:			
				Classification changes	Policy changes	Economic factors	Fiscal forecasting difference
<b>March 2015 forecast</b>							
Welfare spending	219.5	216.9	-2.6	0.0	-2.5	0.5	-0.5
of which:							
Welfare cap	121.0	118.7	-2.2	0.0	-2.5	0.0	0.2
Non-welfare cap	98.5	98.2	-0.3	0.0	0.0	0.4	-0.7
<b>March 2016 forecast</b>							
Welfare spending	218.3	216.9	-1.3	0.0	0.1	0.3	-1.7
of which:							
Welfare cap	119.8	118.7	-1.1	0.0	0.1	0.1	-1.4
Non-welfare cap	98.4	98.2	-0.2	0.0	0.0	0.2	-0.4

### Central government debt interest (net of the APF)

- 3.56** Debt interest payments were significantly lower than we expected in our March 2015 forecast, but close to our March 2016 forecast. Relative to our March 2015 forecast, differences in assumptions about the key underlying determinants reduced spending. Interest rates – both short- and longer-term – have been lower than market expectations (on

which we base our assumptions) at the time. This was partly offset by a higher RPI inflation, which raised accrued payments on index-linked gilts. Relative to our March 2016 forecast, the RPI effect dominated the effect of lower interest rates.

- 3.57 A higher-than-expected interest saving associated with the Bank of England’s Asset Purchase Facility reduced spending relative to both forecasts. Neither anticipated the August 2016 package of monetary policy measures that resulted in a significant increase in the APF’s gilt holdings relative to the assumptions underpinning both forecasts. The Monetary Policy Committee also cut Bank Rate from 0.5 to 0.25 per cent, reducing the cost of financing the APF. These factors have led to larger interest savings for Government. We treat differences relating to the size of the APF as fiscal forecasting ones since it is a judgement that we feed into our debt interest models rather than the one we derive from market expectations.

Table 3.12: 2016-17 debt interest forecast difference

	Forecast	Outturn	Difference	£ billion			
				of which:			
				Classification changes	Policy changes	Economic factors	Fiscal forecasting difference
March 2015 forecast	40.4	35.5	-4.9	0.0	0.0	-3.2	-1.7
March 2016 forecast	35.4	35.5	0.1	0.0	0.0	1.1	-1.0

### Expenditure transfers to EU institutions

- 3.58 The forecasts considered in this report were produced before the EU referendum, while the outturns have not been directly affected by its result. But even abstracting from the referendum, forecasting EU contributions has always been challenging due to uncertainties around EU budgets and associated negotiations, as well as the implicit need to forecast gross national incomes for 27 other member states, as well as the UK.
- 3.59 EU contributions in 2016-17 were slightly lower than forecast in March 2015 (by £0.6 billion) but significantly lower than our March 2016 forecast (by £3.0 billion). Both forecasts were affected by the European Commission’s unexpected and unusual decision not to draw forward future months’ contributions into the first quarter of 2017. (It has typically requested five months’ contributions in the first quarter.) This more than explains the March 2015 difference and accounts for half the overestimate in our March 2016 forecast.
- 3.60 The reasons for revising the forecast up between March 2015 and March 2016, and thus the larger overestimate of spending in that forecast, were largely related to the EU budget and its implementation – key drivers of the amount that the UK needs to contribute each year. In November 2015, we revised up assumed EU spending in line with the 2016 EU budget proposal, in which additional funding was allocated to deal with the migration crisis. We retained this assumption in March 2016 in the absence of new information. In the event, actual spending on areas unrelated to migration was significantly lower than expected, reducing the amount to be covered by member states’ contributions.

Table 3.13: 2016-17 EU expenditure transfers forecast differences

	£ billion						
	Forecast	Outturn	Difference	of which:			
				Classification changes	Policy changes	Economic factors	Fiscal forecasting difference
March 2015 forecast	9.4	8.8	-0.6	0.0	0.0	0.0	-0.6
March 2016 forecast	11.8	8.8	-3.0	0.0	0.0	-0.1	-2.9

### Other spending

3.61 Other points of note in our analysis of spending forecast differences this year include that:

- Although our overall forecasts for **public service pensions** in 2016-17 have been close to outturn, there have been offsetting movements across individual pension schemes. Factors driving this have included differences between assumptions and outturns on early retirements and mortality rates, as well as the response of scheme members to recent policy changes that permit those approaching retirement to 'opt out' of changes in membership terms. Lump sum payments are particularly volatile as retirement behaviour can be difficult to predict, and even small differences in average values or the number of awards can create sizeable deviations from forecast. In addition, the timing and the size of bulk transfers in and out of the schemes – e.g. the movement of Public Health England's members into the civil service pension scheme – can often lead to relatively large one-off differences.
- General government **depreciation** was lower than we forecast in both March 2015 and March 2016, as the average rate of depreciation across the government capital stock appears to have been lower than expected. Depreciation does not affect total spending or net borrowing, but does affect the current budget deficit.
- **Tax litigation** costs were higher than expected at £1.8 billion, but their statistical treatment in outturn differed from their treatment in our forecasts. In March 2015, we included £0.8 billion as negative tax in 2016-17, while in March 2016 we included £0.9 billion as positive spending. In the event, the ONS has treated all the payments made by HMRC in 2016-17 as financial transactions (not affecting receipts, spending or borrowing, but counting against debt since the cash has left the public sector) because they are 'interim'. Consistent with National Accounts guidance, they will only be recognised in spending and borrowing after final decisions on the relevant cases have been made and the value of associated payments finalised. It is difficult to forecast when that might occur given the many options HMRC has for appealing judgements even after making interim payments.
- On the latest data there are large differences between forecast and outturn for **accounting adjustments**, with large upside surprises on current spending only partly offset by downside surprises on capital spending. Across both, the differences amount to around £4 billion and £3 billion relative to our March 2015 and March 2016 forecasts respectively. Thanks to analysis of similar differences in last year's *FER*, part

of these differences have already been reflected in our most recent forecasts. But a significant amount remains unexplained, reflecting unallocated differences between the outturn estimates we are using for the various detailed components of spending and the latest total spending outturns included in the September ONS public finances release. These could reflect temporary timing differences when comparing the latest OSCAR and other source data with the data underlying the ONS estimates, but there could also be genuine underlying factors that would affect our future forecasts. We will be working further with the Treasury and the ONS to understand the sources of these differences more fully as we prepare our November forecast.

## Public sector net debt

- 3.62 In this section we focus on the year-on-year change in debt, rather than its level at the end of the year. This allows us to abstract from differences between forecast and outturn that result from the starting level assumed in each forecast.
- 3.63 Our March 2015 and March 2016 forecasts did not reflect the August 2016 monetary policy package, which has added to PSND in 2016-17 as a result of the purchases of additional gilts and corporate bonds by the Bank of England Asset Purchase Facility (APF) and the lending to commercial banks under the Bank's Term Funding Scheme (TFS). Our March 2016 forecast included the reclassification of most English housing associations into the public sector but neither forecast reflected the subsequent reclassification of the Scottish, Welsh and Northern Irish housing associations. We have restated our forecasts to be consistent with the latest treatment of housing associations in the outturn data, so as to focus on like-for-like forecast differences.
- 3.64 The August 2016 monetary policy package meant that the APF added around £75 billion more to PSND than the relatively small amounts we had factored into forecasts made before that package had been announced. Abstracting from this, PSND increased by less than we expected in our March 2015 forecast, but more than we expected in our March 2016 forecast. Table 3.14 compares each forecast against the latest estimates. It shows that:
- Relative to our **March 2015 forecast**, higher-than-expected gilt premia were the main factor contributing to the smaller-than-expected rise in PSND. We assumed that gilts would continue to be sold at a premium to their face value, at which they are valued in PSND, but that this would be more than offset by the accounting impact of premia related to earlier years' sales unwinding. But further falls in gilt yields caused much higher premia on new gilts than we had expected.<sup>12</sup> Movements in sterling also affect the value of the unhedged component of the international reserves that are netted off PSND. The fall in the pound also contributed to the smaller-than-expected increase in PSND. Offsetting upward contributions included higher borrowing and other accruals adjustments (e.g. the new accounting treatment for corporation tax receipts).

<sup>12</sup> PSND rises by the nominal value of gilts issued, rather than their market value, so the prices obtained in gilt auctions have an accounting impact on public sector net debt.



## The public finances

- Relative to our **March 2016 forecast**, PSND increased a little more than expected. Lower-than-expected proceeds from UKAR and other asset sales were the main factor behind this larger-than-expected rise. This forecast reflected UKAR's decision to begin a major sale programme of Bradford & Bingley (B&B) mortgages, but the sale was delayed following the referendum. It was completed in April 2017, so reduced PSND in 2017-18 instead. Our forecast also included the expected proceeds from starting to sell the student loan book in 2016-17 and the sale of £5.4 billion of RBS shares. The sale of student loans was also delayed, while RBS share sales were put on hold after the referendum result. Lower-than-expected borrowing and higher-than-expected gilt premia were the main offsetting factors. Other accruals adjustments, including those related to corporation tax receipts, again raised debt by more than expected.

Table 3.14: The change in public sector net debt in 2016-17

	£ billion				
	Forecast <sup>1</sup>		Estimates	Difference	
	March 2015	March 2016		March 2015	March 2016
Net borrowing	42.7	55.9	45.0	2.4	-10.9
Lending	17.2	18.6	19.6	2.4	1.0
Asset sales	-2.8	-11.7	-3.5	-0.8	8.2
UKAR	-5.7	-14.3	-4.9	0.8	9.5
Gilt premia	-6.4	-8.0	-18.8	-12.5	-10.9
International reserves	0.0	-0.4	-4.4	-4.4	-4.0
Other non-APF factors	7.0	5.1	14.5	7.5	9.4
<b>Non-APF related change in net debt</b>	<b>52.1</b>	<b>45.2</b>	<b>47.5</b>	<b>-4.6</b>	<b>2.3</b>
Asset Purchase Facility effects	-1.5	3.1	76.6	78.2	73.5
<b>Change in net debt</b>	<b>50.6</b>	<b>48.2</b>	<b>124.1</b>	<b>73.5</b>	<b>75.8</b>

<sup>1</sup> Forecasts have been restated to reflect the reclassification of housing associations to the public sector.

## Year-to-date borrowing in 2017-18

- 3.65** The September 2017 estimate of PSNB in 2016-17 is £45.0 billion, £6.7 billion below our March forecast and, as set out in Box 3.1, £7.0 billion lower than the initial ONS estimate from April. Relative to both our forecast and the initial estimate, this reflects the combined effect of classification and methodology changes and higher-than-expected receipts across a range of taxes, plus other smaller effects. Some of these elements are likely to lead to lower borrowing than we expected in 2017-18 too (e.g. from the methodological changes and, assuming no change in expected bonus growth, the higher tax from bonuses at the end of 2016-17). Others may or may not feed through (e.g. higher VAT and corporation tax receipts could be timing effects rather than signalling stronger ongoing performance).
- 3.66** On the latest estimate, borrowing in the first five months of 2017-18 was broadly flat relative to the same period in 2016-17. Our March forecast predicted that borrowing in the full year would be £58.3 billion, a £6.5 billion year-on-year rise relative to our March estimate of 2016-17 borrowing but a £13.2 billion rise relative to the latest ONS estimate, following the large downward revisions.

- 3.67 Growth in central government receipts over the first five months of 2017-18 of 3.7 per cent has been higher than our full-year forecast of 2.4 per cent. We would expect receipts growth to outpace our full-year forecast until later in the fiscal year because the negative contribution from lower self-assessment receipts (where the boost to 2016-17 receipts from dividend income shifting (described in Box 4.3 of our March *EFO*) will be reversed this year) will only be seen in the data in early 2018. Looking at specific taxes, PAYE income tax and NICs receipts have risen faster in the first five months of 2017-18 than our full-year forecast (4.0 versus 2.9 per cent). This may be because PAYE receipts were subdued in the first half of 2016-17 rather than signalling stronger-than-expected performance this year. VAT receipts so far this year are close to our full-year forecast (3.1 versus 2.9 per cent).
- 3.68 Central government spending (excluding grants to local authorities) over the first five months of 2017-18 was up 4.4 per cent on the same period in 2017-18, slightly slower than our full-year forecast of 4.9 per cent. Our March forecast assumed a large rise in debt interest payments (reflecting the effect of higher RPI inflation on index-linked gilts) and expenditure transfers to the EU (reflecting the timing of calendar year 2017 payments). This has been borne out in the data for the year to date, with debt interest payments up 17 per cent (against a full-year forecast of 14.6 per cent) and expenditure transfers to the EU up 28 per cent (in line with our full-year forecast).
- 3.69 There is still considerable uncertainty around prospects for the rest of 2017-18 – and, as revisions to 2016-17 have shown, it is quite possible that the latest estimates could change significantly over time. The judgements we make about in-year receipts and spending are likely to be an important factor in our next forecast, which will be published alongside the Chancellor's Autumn Budget on 22 November. These will depend on many factors, including the extent to which we expect better 2016-17 outturns to be repeated in 2017-18 or to reflect either one-off developments or timing effects, any further news in the monthly data flow, and any changes to our economy forecast for the rest of the fiscal year.



# 4 Refining our forecasts

## Introduction

4.1 We strive to provide the greatest possible transparency around our forecasts, to facilitate understanding and to ensure that we can be held to account for the judgements we make. Transparency also permits us to scrutinise our own forecasts in detail, examining and explaining the inevitable differences from outturns. We hope that this will reassure users that our forecasts are based on impartial professional judgement, rather than politically motivated wishful thinking, even if they disagree with our conclusions. The process also affords an opportunity to learn lessons that can be applied in future forecasts.

4.2 In this chapter we:

- **Identify lessons that have emerged from the evaluation** described in Chapters 2 and 3. As tends to be the case, these include a number that echo lessons from previous evaluations or that have already been addressed during a forecast process.
- **Describe the systematic review of fiscal forecasting models** that we have carried out to enhance our ongoing work to refine forecast judgements and methodologies. These models are tools – typically operated on our behalf by analysts in other departments – used to help us construct each line of our fiscal forecasts.

## Lessons learnt

4.3 The lessons highlighted in our *Forecast evaluation reports (FERs)* have often been acted upon already, because they were identified during the preparation of our *Economic and fiscal outlook (EFO)* forecasts. In some areas, that has been repeated this year. Lessons that have been reinforced include:

- The importance of the **composition of labour income**, noting that employment-driven growth has been less tax-rich than earnings-driven growth would have been.
- Savings associated with **major reforms of the incapacity and disability benefits** systems had fallen short of expectations, due largely to challenges in delivering the reforms. This has been a theme of recent *FERs* and is an issue that we have explored in depth in *EFOs* and our *Welfare trends reports*. We revised up our forecasts for spending on these benefits in 2016-17 by £1.6 billion between March 2015 and March 2016, but in the event that still proved too little. We have revised these forecasts up further since then – in particular disability benefits, where the reforms are further from completion.

## Refining our forecasts

- The challenges in forecasting **self-assessment (SA) income tax and capital gains tax** receipts. Thanks to data limitations, these forecasts rely on inputs that are less closely aligned with the true tax base than we would like. The assumptions that need to be fed into the forecasting models are therefore a significant source of uncertainty around the forecasts themselves. Forecasting SA tax receipts is further complicated by large behavioural responses to policy changes (e.g. forestalling ahead of last year's dividend tax rise), trends towards incorporations and changes in the income distribution.
- The use of **local authority reserves** has been a repeated source of surprise relative to our forecasts. Against our earlier forecasts, this was because local authorities underspent against their budgets and added to their reserves when we had expected budget cuts to prompt them to draw on those reserves. Relative to the forecasts evaluated in this report, local authorities have utilised more of their reserves than we were expecting. Prudential borrowing in 2016-17 was also higher than expected.

4.4 One persistent theme in the evaluation of our economy forecasts – and which has been addressed in repeated, though seemingly inadequate, revisions in past *EFOs* – is the weakness of productivity growth and the strength of employment growth. This pattern has been repeated at a one-year horizon relative to every one of our spring forecasts, and it held regardless of whether GDP growth as a whole exceeded or fell short of our forecast. Considering the first half of 2017 relative to our most recent forecast from March, the same pattern has been repeated more forcefully.

4.5 In the light of this and in preparation for our November forecast we have reviewed the latest evidence against our March forecast judgements and the explanations of the productivity puzzle that informed them. It seems clear that we will need to revise down trend productivity growth again, but also that our equilibrium unemployment assumption is too high and that assuming the historical downward trend in average hours worked will resume in the short term is not justified. We will review all the available evidence as we prepare our November forecast, but it is highly likely that the downward revision to productivity growth will dominate in terms of its effect on cumulative GDP growth over the forecast horizon and the associated consequences for the budget deficit.

4.6 While most of the major issues that we have identified in this year's evaluation have featured in previous reports, we have identified some new issues that include:

- The importance of **corporation tax payment timing assumptions**. The speed at which companies pay off the liabilities arising from a particular year's profits can have a marked effect on receipts. In addition, the surge in receipts from life assurance companies in 2016-17 suggests that we need to look further at how the effect of bond price movements on profits in the sector are modelled.
- The unexplained downward **trend in tax credits and in-work housing benefit caseloads**. In recent forecasts we have made successive and substantial downward revisions to tax credits spending, with similar, if smaller, revisions to the in-work element of the housing benefit caseload. In tax credits this appears to be related to lower-than-

expected inflows (rather than higher-than-expected outflows) and to average incomes across the caseload rising faster than assumed. The underlying drivers of these forecast differences remain under investigation.

- The challenges and importance of the **in-year estimates for receipts and spending** that form the basis of our fiscal forecasts. As most of our models are specified to forecast the *growth* of a tax or spending stream from a starting point, any difference between forecast and outturn for the year in progress when the forecast is made will compound over the forecast period. We use the latest available data – including administrative data – when making these estimates, but the pattern of receipts or spending through the year can change and subsequent revisions can change the picture significantly, as illustrated by the large revisions to 2016-17 since our March forecast.

## Review of fiscal forecasting models

- 4.7 In preparing our fiscal forecasts we utilise more than 350 individual models of greatly varying size and complexity. We start the forecast process by considering how our most recent forecast has performed against the flow of monthly data and any other relevant information. In doing so, we frequently identify issues that prompt us to refine our judgements or the parameters of our models.
- 4.8 In line with the recommendations of the Treasury's September 2015 review of the OBR, we have introduced a more systematic approach to following up our analysis of fiscal forecasting differences and issues raised in *EFO* forecasting rounds. We have been working closely with our partners across government in doing so. This has been guided by the broad criteria set out in our 2015 *FER* and refined last year and the fiscal forecasting accuracy metric that we described in our 2016 *FER*.<sup>1</sup>
- 4.9 In this year's *FER* we set out our initial results and the associated priorities for model development over the next 12 months. To put that in context, we start by reviewing recent and ongoing modelling work that has affected, or is expected to affect, our forecasts.

### Modelling work over the past year

- 4.10 The process of refining our models and the judgements underpinning our fiscal forecasts is a continuous one that draws on analysis prepared in forecasting rounds and for our *FERs*. This review builds on existing processes and helps to ensure they are more consistent and followed up more systematically. Over the past year, some of the more significant modelling changes that have already been factored into our forecasts include:
- **Incorporations model:** our tax forecasts include modelled adjustments to reflect the trend towards employees and the self-employed choosing to incorporate and to work and pay tax as company owner-managers instead. In our November 2016 forecast, we moved to a new model to estimate the effect of that trend on our receipts forecast.

<sup>1</sup> HM Treasury review of the Office for Budget Responsibility, HM Treasury, September 2015.

## Refining our forecasts

The modelling and its implications were detailed in Box 4.1 of that *EFO*. The overall effect was to reduce receipts by £1.6 billion in 2020-21 relative to the previous model, with incorporations estimated to reduce receipts by £2.5 billion in that year relative to them growing in line with total employment from the start of the forecast period.

- **VAT standard-rated share (SRS) model:** our VAT receipts forecast uses the SRS model to convert our forecast for consumer spending into the theoretical VAT yield one would expect from it. The proportion of spending subject to the 20 per cent standard rate of VAT is the most important element of that modelling. In our March *EFO*, we moved to using a new SRS model that better reflected recent trends – in particular those related to spending on consumer durables – and that improved consistency between our economy and VAT forecasts. The effect was to reduce VAT receipts by around £0.4 billion in 2021-22.
  - **Excise duties models:** our fuel and alcohol duties models each use time-series econometric models to generate forecasts for taxable consumption – known as clearances – of each product. The underlying equations were updated for our November 2016 and March 2017 forecasts respectively. The overall effect was to boost fuel duty receipts by £1.2 billion in 2021-22, but to reduce alcohol duty receipts by £0.2 billion in that year.
  - **Housing associations model:** since the ONS's October 2015 decision to reclassify housing associations into the public sector we have been refining our approach to forecasting their effects on the public finances. In our March *EFO*, we made changes to reflect properly the routing of some central government capital grants to housing associations via local government. We also introduced new models to forecast the effects of housing associations in Scotland, Wales and Northern Ireland, where previously we had simply grossed up our forecast for England.
  - **Asset Purchase Facility (APF) model:** the Bank of England's APF holds over £400 billion of gilts and currently replaces any that mature by reinvesting the proceeds in new gilts. As well as affecting debt interest flows between public sector entities, it has an accounting effect on public sector net debt (PSND) that is driven by the difference between the market value paid for the gilts that are purchased and their nominal or face value. In our March *EFO* we corrected the way the model captured changes in this accounting effect as the APF is assumed to make future gilt purchases as existing holdings mature, where the market premium had been overestimated. This change reduced PSND by £20 billion in 2021-22.
- 4.11 Modelling work completed since March that we plan to incorporate in our November 2017 *EFO* includes:
- **North Sea revenues model:** over the past year we have been working with HMRC to build a new model for projecting oil and gas revenues. The previous model was opaque, making it difficult to scrutinise the forecast outputs effectively, and time-consuming for HMRC officials to operate and maintain. While developing the new

model, HMRC identified an issue in the way that company-level losses were being carried forward to be set against future profits. This was corrected in our March forecast, reducing receipts by around £1 billion a year. We do not expect the full move to the new model in November to have further material effects on the forecast, although it will inevitably deliver different results to those that the old model would have using the same determinants. Such effects will be set out in the *EFO*.

- Property transaction taxes:** we have been working with HMRC and the Scottish Fiscal Commission (SFC) to develop, respectively, our stamp duty land tax (SDLT) and Scottish land and buildings transaction tax (LBTT) models. The most significant change will be to factor in a negative effect on transactions from the rising effective tax rate through the forecast period that results from house prices rising relative to the thresholds in the progressively structured SDLT and LBTT systems. The extent of this effect will be calibrated using initial HMRC analysis of the transactions response to the changes in effective tax rates across the house price distribution from the reform of residential SDLT announced in December 2014. This points to effects almost twice those factored into the costing of that policy change.<sup>2</sup> This change will reduce the extent of fiscal drag over the forecast, with the effect concentrated among higher-priced properties where marginal tax rates are much higher. If we had included this adjustment in our March 2017 SDLT forecast, it would have been lower by around £0.7 billion in 2021-22. We have also developed a new ‘log-normal’ LBTT model to replace our previous microsimulation approach. This is similar to the approach used by the SFC. It is not expected to have a significant effect on our next forecast.
- Depreciation model:** we have been working with the Treasury to build a new model that is more transparent and that addresses the systematic over-prediction of outturn. The constraining factors that are applied to link the underlying forecast model to the outturn data are also being reviewed as part of this process. Moving to this model will affect the split of net borrowing between the current budget deficit and net investment, but will have no effect on net borrowing itself.

4.12 There are a number of other model development projects that are close to completion, but where we cannot yet quantify the effects with confidence. These include:

- Index-linked gilts accrued debt interest model:** our debt interest models include separate treatment of different forms of debt. The most complex of these relates to index-linked gilts, where accrued debt interest reflects the real coupon, an RPI-linked coupon payment, an RPI-linked uplift to the value of the gilt and the amortisation of the premium (or discount) at which it was sold relative to its par value. With real interest rates currently negative, but real coupons subject to a lower bound of 0.125 per cent, modelling these various effects is more complicated. We have identified an issue whereby the current model appears to overestimate spending on index-linked gilts by using stylised calculations that do not capture accurately the effects of negative

<sup>2</sup> We provided detailed information on these behavioural responses in Box 4.5 of our December 2014 *Economic and fiscal outlook* and a supplementary release in January 2015. A supplementary release detailing the new elasticities is available on our website.



## Refining our forecasts

real rates and the large auction premia that result. We are not yet in a position to quantify the downward revision precisely, but it appears to be material and is likely to exceed £½ billion a year by the end of the forecast period.

- **Landfill taxes:** we have been working with HMRC and DEFRA to improve our model for projecting UK Government landfill tax receipts. The model has been changed to focus more on forecasting the amount of waste paying the higher 'standard rate' of tax, which accounts for over 95 per cent of receipts, rather than the total amount of waste generated. DEFRA has also re-estimated the profile of waste that is exported or incinerated rather than sent to landfill. By the end of the forecast period these changes are expected to lower receipts slightly. All else equal this would have proportional effects on our forecasts for devolved landfill tax receipts in Scotland and Wales.

4.13 This is not an exhaustive list of potential modelling changes that will affect our future forecasts. One important issue that we will revisit is the modelling of disability benefits spending, where our forecast currently includes a top-down adjustment to caseload growth that aims to capture the updated trend in the proportion of the population claiming these benefits. And as always we can expect issues to arise as we update and scrutinise our models through the usual challenge process. In some cases we will be able to adjust our models relatively quickly. In others, the necessary development work will be incorporated into future plans. We will highlight prospective changes in future *FERs* where possible.

## The 2017 review

4.14 In carrying out the first review this year:

- **We have selected 19 separate tax and spending forecast models** to look at in greater detail. Our choices were based on the amount of tax or spending that they cover, their performance against the forecast accuracy metric developed last year, and a review of issues raised during past challenge and scrutiny processes.
- **We have codified a set of questions that allow us to benchmark fiscal forecast models** against our ideal requirements for them. These have ensured consistency when considering how individual models perform relative to the five broad criteria described last year. They are detailed in the next section.
- **We have assessed each model against these criteria** and identified priorities for development work over the coming year. These are based on our assessment of the importance of each issue in relation to the tax or spending stream itself and, reflecting its absolute size, to our overall fiscal forecasts.

4.15 Table 4.1 at the end of this chapter summarises the models that we have reviewed this year and the priorities attached to future development work.

- 4.16 It is important to note that the results of this review do not capture every potential issue that may arise and that the appropriate conclusions may evolve over time. For example, the suitability of a modelling approach may change as economic factors and policy develop. This is illustrated by the modelling changes made to our SDLT forecast. Prior to December 2014 we used a time-series econometric approach. At that point significant changes to the policy regime meant that relationships estimated from historical data were no longer relevant to the future. We therefore moved to a microsimulation approach. This calculates the tax due under the new policy regime on a distribution of property transactions derived from administrative tax data, which is projected forward in line with our assumptions about house price inflation and the total number of transactions.

### Assessment criteria

- 4.17 There are five criteria against which we assess our fiscal forecast models: accuracy, plausibility, transparency, effectiveness and efficiency. To consider models against these criteria in a consistent way, we codified a set of questions often asked during our usual challenge and scrutiny processes. As the review progressed, we expanded the list as other themes arose. For example, it became apparent that the approach to setting 'in-year' forecasts varied across models and was sometimes a key source of differences between forecast and outturn. We can expect further questions to be added in future reviews.
- 4.18 This section sets out the questions we asked of each model under each assessment criterion.

### Accuracy

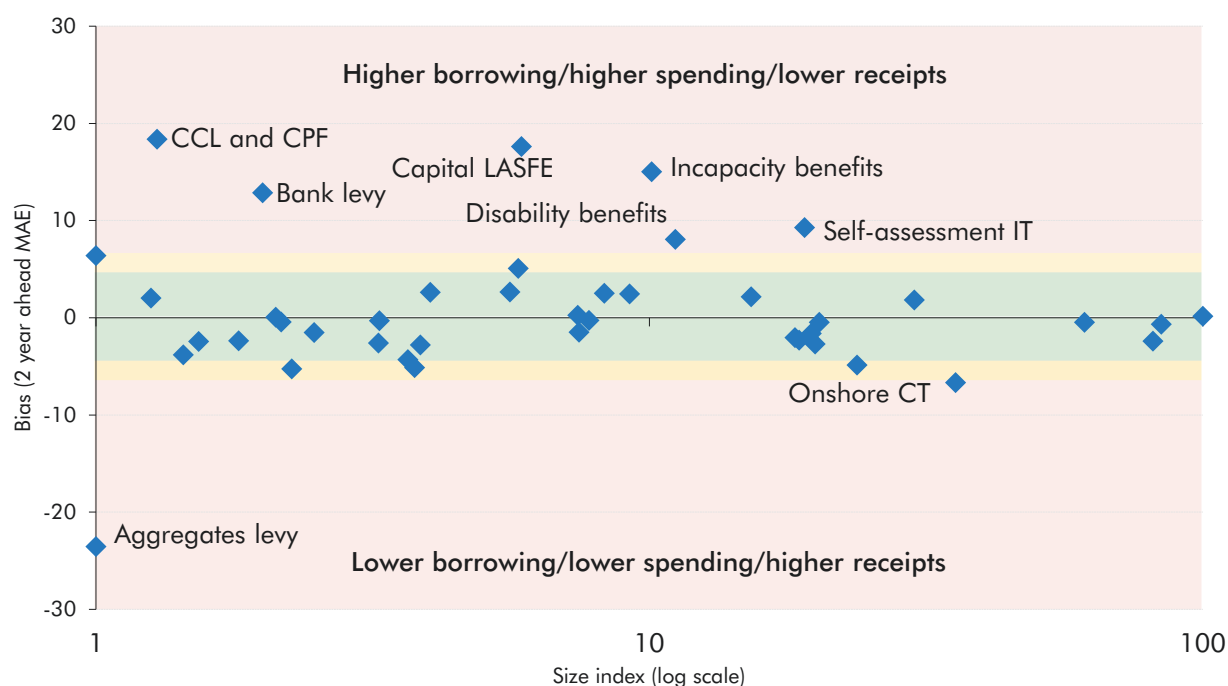
- 4.19 **How big or consistent are the fiscal forecasting differences?** As part of our annual *FER* process, we assess the performance of our fiscal forecasts by identifying and explaining the difference between our forecasts and outturn. We decompose these forecasting differences into four categories:
- **classification and accounting treatment changes** made by the ONS or the Treasury;
  - subsequent Government **policy changes**;
  - **economy forecast** differences; and
  - a residual '**fiscal forecasting difference**'.
- 4.20 We investigate the underlying factors explaining the fiscal forecasting element, which typically relate to assumptions we feed into our models but can also reflect problems with the models themselves. In each *FER* we analyse our one- and two-year ahead fiscal forecast differences for relevant March forecasts. This gives us a consistent dataset that can be used to measure the relative accuracy of the components of our fiscal forecasts.
- 4.21 Our 2016 *FER* sets out how we calculate the one- and two-year ahead mean absolute percentage errors (MAPE), and how we adjust them for the volatility of the underlying tax or spending stream. This allows us to identify the forecast models that should be subjected to

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extra scrutiny because the associated forecasts have diverged from outturns by more than the average model if it were faced with a constant degree of underlying volatility. We also consider the mean average error (MAE) – a measure of bias rather than accuracy – as a check on whether we are systematically over- or under-forecasting outturns.

- 4.22 Chart 4.1 shows the two-year ahead MAEs for our tax and spending forecasts since March 2012. As with the accuracy analysis, this is used to calibrate a ‘RAG’ rating for each model. The green area reflects differences below the (absolute) average in either direction, amber reflects differences that are less than 2 percentage points above the average and red reflects differences that are more than 2 percentage points above the average.

Chart 4.1: Mean average fiscal forecasting errors



- 4.23 **Are we able to explain fiscal forecasting differences?** Care is needed when drawing conclusions from analysis of fiscal forecasting differences, because they can reflect a wide range of factors. Most will fall into one of two categories: factors directly related to the model (such as its specification) and factors related to use of the model (such as the assumptions and judgements fed into it).

- 4.24 The forecast models set out in Chart 4.1 provide examples of both cases. In particular, the consistent over- and under-predictions from our self-assessment income tax and onshore corporation tax models appear to reflect modelling issues. Our priorities in tackling these issues are set out in the results section below. By contrast, the consistent over-prediction of climate change levy and carbon price floor (CCL and CPF) receipts reflects a change in the composition of the tax base (in particular away from coal-based energy generation towards renewables) relative to the assumptions that were fed into the model. Similarly, the consistent under-prediction of aggregates levy receipts appears to reflect underestimating the tax base – specifically the buoyancy of the tax base relative to real GDP growth.

- 4.25 To understand the drivers of the fiscal forecasting difference, we ask a number of questions in order to draw appropriate conclusions. These are described in more detail in a new briefing paper that we have published alongside this report – *Evaluating forecast accuracy* – which is available on our website.

### Plausibility

- 4.26 **Is the model specified in the appropriate way?** Several factors need to be considered when choosing the type of model to forecast a stream of tax or spending. For example, a time-series econometric approach can be useful when there is a clear and reasonably straightforward relationship between determinants that can be drawn from our economy forecast and elements of the tax or spending stream. But consideration should be given to other factors, such as the historical stability of the tax or spending regime, which could alter the relationships over time and introduce biases into their estimated values. This is one reason why in some cases a microsimulation or more disaggregated approach may be more suitable.

- 4.27 **Do model assumptions meet nine key plausibility requirements?** The specification of a model gives an analytical framework in which to analyse trends in tax and spending. The assumptions applied to that model reflect the judgement of the forecaster and should be grounded in both theory and evidence. All assumptions and judgements in our fiscal forecasts are the responsibility of the Budget Responsibility Committee (BRC), who draw on the analysis and expertise of officials in other government departments in order to reach those decisions. In general, we require that assumptions should:

- **have a theoretical underpinning:** for example, there should be an economic rationale behind an econometric model;
- **reflect the structure of the underlying tax or spending system:** for example, a linear growth rate should not be applied when modelling a tax system that does not move linearly over time (e.g. a receipts stream that grows faster than the underlying tax base due to fiscal drag);
- **be consistent with recent experience:** clear trends or patterns in the outturn data should be reflected in forecast assumptions, unless there is firm evidence to suggest otherwise;
- **be central:** Parliament requires us to judge whether the Government has a better than 50/50 chance of achieving its fiscal targets on current policy, so we aim to produce central (median) forecasts with equal probability of outcomes being above or below them (i.e. we do not seek to be deliberately cautious or to include contingencies for unlikely events);
- **be well-evidenced:** we draw on the expertise and experience of analysts in other government departments, asking that assumptions proposed to us for use in the forecast should be informed by operational information, external estimates, economic literature, market research, and so on;

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- **be reviewed frequently:** at least every year for those that are most material to our overall fiscal forecast and at least once every three years for all assumptions;
- **be as stable as possible:** our fiscal forecasts are produced twice a year (and occasionally more frequently) and assumptions should not lead to large or erratic changes from forecast-to-forecast unless that is required by the evidence (e.g. econometric models should not include complex lag structures that introduce volatility);
- **reflect the latest data:** for example, where a microsimulation model draws on annual survey or administrative data, it should be updated as soon as possible after a new year of information becomes available; and
- **reflect current Government policy:** as required by the remit set by Parliament.

**4.28 Is the in-year forecast set using a systematic process and justified using the best information?** Most of our fiscal forecast models are designed to forecast growth in receipts or spending from a starting point, rather than the level itself. Rather than using the previous year's outturn as that starting point, we produce an 'in-year forecast' for the year in progress that supplements our model outputs with a range of administrative and operational information on monthly receipts and spending. This 'jumping-off' point is extremely important since any difference between forecast and outturn here will be compounded over the forecast period. It is therefore vital that departments provide us with the best available information and use a systematic approach in order for us to make an informed central forecast.

**4.29 Is the model consistent with the rest of the forecast?** Given the disaggregated and interdependent nature of our fiscal forecast, it is important that the overall fiscal and economy forecasts are internally consistent on four levels. Each element should be consistent with:

- **our overall economy forecast:** for example, our forecast for the VAT tax base must be consistent with the forecast for consumer spending that is a component of our overall GDP forecast;
- **other aspects of the fiscal forecast:** this can be more challenging where there are common or interlinked effects that should feature in models operated for us by different departments (e.g. tax credits, modelled by HMRC, include disability premia that are directly linked to the disability benefits modelled for us by DWP);
- **ONS accounting treatment:** e.g. for many receipts streams, the ONS time-shifts cash receipts back to proxy for the point at which the tax liabilities were accrued; and
- **current Government policy:** as required by the remit set by Parliament.

## Transparency

- 4.30 To what level of detail can OBR staff scrutinise the workings of the model?** The models that underpin our fiscal forecast are typically owned and maintained by other parts of government that are responsible for administering the element of tax or spending. In many cases, it is not possible for departments to open up the full model for OBR staff to scrutinise on the BRC's behalf. Most commonly this will be due to data protection issues (e.g. the 'personal tax model' that underpins our PAYE IT and NICs forecast contains confidential taxpayer information that cannot be shared). Subject to these important restrictions, we aim for OBR staff to get as close as possible an understanding of the workings of the models. Having satisfied ourselves that a model is working as intended, we then rely on summary outputs and analysis to help inform our forecast judgements and assumptions.
- 4.31** A good example of this is the new North Sea model that we plan to adopt in our next *EFO*. The microsimulation model developed by HMRC over the past year projects individual taxpayer liabilities forward using specialist statistical software, so it would not be possible for OBR staff to view all its workings. Instead, we have worked with HMRC to develop a range of diagnostics that will be used during each forecast process.
- 4.32 Does the model documentation provide everything the BRC needs?** Model documentation needs to be clear and comprehensive in order to allow the BRC to use the model effectively to produce a central forecast. Some of the items we require include a full list of model inputs and key modelling assumptions. For many lines of tax and spending, we set out this information on the *Forecasts in depth* section of our website.
- 4.33 Do forecast notes provide everything the BRC needs?** It is important for the BRC to understand how and why model outputs change in response to new policies, changes in economic determinants and other factors. Forecast-to-forecast diagnostics are key in understanding the effect of new information and judgements, so each model needs to be able to generate these effectively. We explain these forecast-to-forecast diagnostics in each *EFO* and look at them between forecast rounds to ensure that our fiscal forecast evolves appropriately as we refine our economy forecast and make other judgements.

## Effectiveness

- 4.34 Is the model structured in the best way?** There are clear benefits to keeping forecast models as simple as possible so that their outputs can be readily understood and scrutinised. But there are also benefits to having models that are sufficiently disaggregated to capture the dynamics of the tax or spending stream being modelled. The trade-off between these objectives is a judgement ultimately made by the BRC. One aspect of that trade-off is that greater disaggregation often requires the forecasting of a greater number of inputs to run the model, so while it may model outturns effectively as a forecasting tool it becomes too cumbersome and reliant on too many uncertain judgements about inputs.
- 4.35 Are the best available data being used?** Our forecasts should be based on the best and most timely data available, so it is important that the models underpinning it are frequently updated and that the potential benefits of new or supplementary sources are considered.

## Refining our forecasts

- 4.36 **Are effective quality assurance processes in place?** It is important that the models underpinning our public finances forecasts are of high quality and free of error. We expect departments to follow the quality assurance guidelines and recommendations of the 2013 Macpherson Review.<sup>3</sup>

## Efficiency

- 4.37 **Can the model be run and quality assured in a short time span?** Our fiscal forecasts are prepared in a time-pressured environment in which models are used in iterative forecast rounds ahead of a Budget or other fiscal statement. The final rounds of this process are particularly short. It is important that models can be run and quality assured, and that the forecast outputs and any accompanying documentation (such as forecast notes and diagnostics) can be delivered to the OBR sufficiently far in advance of challenge meetings to allow us to scrutinise them effectively.

## Results of the review

- 4.38 We have identified some overarching issues that we plan to work on over the next year:
- **Supplementing our microsimulation models with top-down approaches:** the bottom-up methodology used to model complex tax and spending systems such as state pension spending and SDLT is often necessary in order to capture fully the interaction of the population with the tax or spending system. But these approaches involve a trade-off, as the volume of underlying data and complexity of the process mean it is sometimes difficult to unpick the key drivers and trends in the modelling. We have concluded that there would be value in developing simple, top-down representations of these microsimulation models as a cross-check against the full bottom-up modelling and to improve our understanding of the underlying processes being simulated.
  - **The balance between short- and long-term dynamics in our econometric models:** the trade-off between the weight placed on recent experience and longer-term trends is a constant challenge faced by forecasters. Where forecasts are produced using error correction models, it is important to review the long-term element to ensure that it is plausible in the light of recent evidence that will be given less weight by an econometric approach. For example, the error correction model we use to forecast distances travelled in our fuel duty model is estimated over 15 years of data. The strong growth of recent years in distances travelled by light goods vehicles means that it has been under-predicting outturns. Factoring changes in historical trends into a forecast often requires judgemental adjustments to be made to raw model outputs.
  - **The impact of policy changes on the modelling approaches we use:** significant policy changes can require fundamental changes to the way in which we model a tax or spending stream. As was the case following the residential SDLT reforms in December 2014 described in paragraph 4.16. In this review, we have identified a number of

<sup>3</sup> See *Review of quality assurance of Government analytical models: final report*, HM Treasury, March 2013.

models that require further development in light of recent policy changes, notably the self-assessment income tax model, as described below.

4.39 As well as these general conclusions, we have attached a high priority to development work on three forecasting models:

- **Onshore corporation tax:** in recent forecasts we have repeatedly under-forecast onshore CT receipts. We will work with HMRC to review the main industrial, commercial and financial sector components of this model, including the econometric equations that are used to project key income and deduction streams. We are also working with HMRC to improve the transparency of the model.
- **Self-assessment income tax:** we have repeatedly over-forecast receipts in recent years. This appears to be due to weakness in the effective tax rate that has not been captured by the model. We will therefore consider alternative approaches to modelling the effective tax rate. The effective tax rate has been volatile as well as weak, probably reflecting a combination of policy changes, movements in the income distribution and the trend towards incorporation. We will also be working with HMRC and the ONS to investigate and better understand trends in the tax base and how these income streams are captured in the National Accounts.
- **Universal credit (UC):** as the rollout of UC accelerates over the next year, the amount of spending flowing through the system will rise significantly. We currently factor UC into our forecasts as a marginal effect relative to the existing system rather than on a full-cost basis. This will become more problematic as a growing share of outturn data will reflect UC rather than the existing system that is being replaced. The shift to UC also involves a number of complex changes in entitlement and the possibility that recipients' behaviour will change in response – e.g. take-up rates, error and fraud, and decisions about whether and how much to work. Assumptions made in all these areas will need to be reviewed as evidence of actual effects becomes available. We will set out our latest UC modelling in detail in our next *Welfare trends report*, which will be published later in 2017-18.

4.40 A summary of the conclusions of our review in relation to each model are available in a new database on our website. We will continue to report on model developments in future *EFOs* and *FERs*. Table 4.1 sets out the priority that we have attached to development work for each model under each criteria.



Table 4.1: Priorities for future model development work

	Priorities for future model development work					Overall
	Accuracy	Plausibility	Transparency	Effectiveness	Efficiency	
Onshore corporation tax (main industrial, commercial and financial components)	H	H	H	M/H	L/M	H
Self-assessment income tax	H	H	M/H	H	L/M	H
Universal credit marginal cost	H	H	L/M	M	M	H
Capital gains tax	H	H	M	L/M	L/M	M/H
Civil service pension scheme	M	M/H	H	H	L/M	M/H
Council tax	M	L/M	M	M	L	M
Customs duties	H	H	L	L	L	M
Fuel duties	M/H	M/H	L/M	L	L	M
General government depreciation	M	M/H	L/M	L/M	L	M
Insurance premium tax	L/M	H	M	L/M	L	M
PAYE and NIC1 integrated model Personal tax model (PTM)	L/M	L/M	M	L/M	L	M
SDLT	L/M	M	M	L/M	L	M
Tobacco duties	M	M	L	L	L	M
CG debt interest (main gilts model)	L/M	M	L/M	L	L	L/M
PENFORM model	L/M	L/M	L	L	L	L/M
VAT (VTTL and SRS models)	L/M	L/M	L	L/M	L	L/M
VAT refunds	L/M	L/M	L/M	L	L	L/M
North Sea revenues	L	L/M	L	L/M	L	L

4.41 Over the coming year, we will review a different set of models, but will also revisit our conclusions about the larger streams of tax and spending. This year's *FER* results have highlighted a number of possible areas for future review, including the life assurance component of the onshore corporation tax model, the personal tax credits model, accounting adjustments within total spending and other components of our local authorities' self-financed expenditure forecast. We will also continue to review those models most likely to be affected by Brexit – for example, the modelling implications arising from any change to the membership or structure of tax systems for which there are common EU rules, such as VAT or customs duties.

# A Detailed economy and fiscal tables

A.1 This annex contains further details of our March 2015 and March 2016 forecast differences for the economy and public finances, including:

- our **calendar year GDP growth and deflator** forecast differences (Tables A.1 to A.4);
- forecasting differences for the key **economic determinants** that underpin the fiscal forecast (Tables A.5 to A.6);
- forecast differences for **total receipts** (Tables A.7 to A.8), **overall spending** (Tables A.9 to A.10) and **welfare spending** (Tables A.11 to A.12). These forecast differences are broken down into components that are due to ONS methodological or classification changes, subsequent policy changes, economy forecast differences and the residual 'fiscal forecasting difference'; and
- restated forecasts and the adjustments required within the fiscal forecast to account for the **ESA10, public sector finances (PSF) review and housing associations classification changes** (Tables A.13 to A.16).

Table A.1: Contributions to real GDP growth

	Percentage points							GDP
	Private consumption	Business investment	Other private investment	Total Government	Net trade	Stocks and statistical discrepancy		
<b>Forecasts</b>								
<b>March 2015</b>								
2015	1.6	0.5	0.1	0.2	-0.1	0.1	2.5	
2016	1.8	0.8	0.2	-0.1	-0.4	0.0	2.3	
<b>March 2016</b>								
2016	1.6	0.2	0.3	0.0	-0.4	0.3	2.0	
<b>Latest data</b>								
2015	1.7	0.3	0.2	0.0	-0.1	0.2	2.3	
2016	1.8	0.0	0.4	0.2	-0.9	0.3	1.8	
<b>Difference<sup>1</sup></b>								
<b>March 2015</b>								
2015	0.0	-0.2	0.0	-0.2	0.0	0.2	-0.1	
2016	0.1	-0.8	0.1	0.3	-0.6	0.3	-0.5	
<b>March 2016</b>								
2016	0.2	-0.3	0.1	0.2	-0.5	0.1	-0.2	

<sup>1</sup> Difference in unrounded numbers.

Table A.2: Contributions to nominal GDP growth

	Percentage points						
	Private consumption	Private investment	Total Government	Net trade	Stocks	GDP	Statistical discrepancy
<b>Forecasts</b>							
<b>March 2015</b>							
2015	2.4	1.1	0.1	0.1	0.2	4.1	0.3
2016	2.7	1.3	-0.3	-0.2	0.0	3.5	0.0
<b>March 2016</b>							
2016	2.4	0.7	0.1	-0.5	0.3	3.1	0.1
<b>Latest data</b>							
2015	2.1	0.7	0.1	0.2	-0.3	2.8	-0.1
2016	2.7	0.6	0.5	-0.6	0.0	3.8	1.6
<b>Difference<sup>1</sup></b>							
<b>March 2015</b>							
2015	-0.3	-0.4	0.0	0.1	-0.5	-1.3	-0.4
2016	0.0	-0.7	0.8	-0.4	0.0	0.3	1.6
<b>March 2016</b>							
2016	0.4	-0.2	0.4	-0.1	-0.3	0.7	1.5

<sup>1</sup> Difference in unrounded numbers.

Table A.3: Growth in National Accounts deflators

	Per cent					
	Private consumption	Private investment	Total Government	Exports	Imports	GDP
<b>Forecasts</b>						
<b>March 2015</b>						
2015	1.1	2.5	-0.5	-4.5	-4.8	1.6
2016	1.4	1.6	-1.2	-1.1	-1.3	1.1
<b>March 2016</b>						
2016	1.2	1.4	0.3	1.2	1.6	1.1
<b>Latest data</b>						
2015	0.6	1.1	0.4	-5.1	-5.9	0.5
2016	1.4	1.7	1.2	4.7	3.0	2.0
<b>Difference<sup>1</sup></b>						
<b>March 2015</b>						
2015	-0.5	-1.3	0.9	-0.6	-1.1	-1.1
2016	-0.1	0.0	2.3	5.7	4.3	0.9
<b>March 2016</b>						
2016	-0.1	0.0	2.3	5.7	4.3	0.9

<sup>1</sup> Difference in unrounded numbers.

Table A.4: Contributions to nominal GDP (income) growth

	Percentage points					GDP	Statistical discrepancy
	Compensation of employees	Corporations' gross operating surplus	Other income	Taxes on products and production			
<b>Forecasts</b>							
<b>March 2015</b>							
2015	2.1	0.9	-0.4	0.2	4.1	1.2	
2016	2.1	0.2	1.0	0.3	3.5	0.0	
<b>March 2016</b>							
2016	1.6	-0.2	-0.1	0.6	3.1	-0.4	
<b>Latest data</b>							
2015	1.5	0.1	0.9	0.3	2.8	0.0	
2016	2.0	0.5	0.7	0.5	3.8	0.1	
<b>Difference<sup>1</sup></b>							
<b>March 2015</b>							
2015	-0.6	-0.9	1.3	0.1	-1.3	-1.2	
2016	-0.1	0.4	-0.3	0.2	0.3	0.1	
<b>March 2016</b>							
2016	0.4	0.7	0.8	-0.1	0.7	0.5	

<sup>1</sup> Difference in unrounded numbers.

Table A.5: March 2015 fiscal determinant forecast differences for 2016-17

	Percentage change on a year earlier, unless otherwise stated		
	Forecast	Outturn	Difference
<b>GDP and its components</b>			
Real GDP	2.3	1.8	-0.5
Nominal GDP (£ billion) <sup>1</sup>	1943	1981	38
Nominal GDP <sup>1</sup>	3.5	4.2	0.7
Wages and salaries <sup>2</sup>	3.8	4.0	0.2
Non-oil PNFC profits <sup>2,3</sup>	3.5	6.8	3.3
Consumer spending <sup>2,3</sup>	4.2	4.4	0.2
<b>Prices and earnings</b>			
GDP deflator	1.2	2.3	1.1
RPI (September)	2.2	2.0	-0.2
CPI (September)	1.2	1.0	-0.2
Whole economy earnings growth	3.1	2.9	-0.2
<b>Other key fiscal determinants</b>			
Claimant count (millions) <sup>4</sup>	0.74	0.78	0.0
Employment (millions)	31.4	31.8	0.4
VAT gap (per cent) <sup>5</sup>	9.9	9.7	-0.2
<b>Financial and property sectors</b>			
Equity prices (FTSE All-share index)	3937	3700	-237
HMRC financial sector profits <sup>1,3,5,6</sup>	3.5	4.1	0.6
Residential property prices <sup>7</sup>	5.3	6.2	0.9
Residential property transactions (000s)	1211	1155	-56
Commercial property prices <sup>8</sup>	1.0	-12.0	-13.0
Commercial property transactions <sup>8</sup>	2.7	6.1	3.4
<b>Oil and gas</b>			
Oil prices (\$ per barrel) <sup>3</sup>	69.2	44.0	-25.2
Oil prices (£ per barrel) <sup>3</sup>	44.9	32.5	-12.4
Gas prices (p/therm) <sup>3</sup>	50.3	34.6	-15.7
Oil production (million tonnes) <sup>3</sup>	36.7	47.4	10.7
Gas production (billion therms) <sup>3</sup>	11.9	14.5	2.6
<b>Interest rates</b>			
Market short-term interest rates (per cent) <sup>9</sup>	1.2	0.4	-0.8
Market gilt rates (per cent) <sup>10</sup>	2.3	1.2	-1.1
Euro/Sterling exchange rate	1.36	1.19	-0.17
<sup>1</sup> Not seasonally adjusted.	<sup>6</sup> HMRC Gross Case 1 trading profits		
<sup>2</sup> Nominal.	<sup>7</sup> Outturn data from ONS House Price Index.		
<sup>3</sup> Calendar year.	<sup>8</sup> Outturn data (ex. Scotland) from HMRC <i>Annual stamp tax statistics</i> .		
<sup>4</sup> UK seasonally-adjusted claimant count.	<sup>9</sup> 3-month sterling interbank rate (LIBOR).		
<sup>5</sup> No outturn available, latest forecast from March 2017	<sup>10</sup> Weighted average interest rate on conventional gilts.		

Table A.6: March 2016 fiscal determinant forecast differences for 2016-17

	Percentage change on a year earlier, unless otherwise stated		
	Forecast	Outturn	Difference
<b>GDP and its components</b>			
Real GDP	2.0	1.8	-0.2
Nominal GDP (£ billion) <sup>1</sup>	1943	1981	38
Nominal GDP <sup>1</sup>	3.6	4.2	0.6
Wages and salaries <sup>2</sup>	3.9	4.0	0.1
Non-oil PNFC profits <sup>2,3</sup>	3.8	6.8	3.0
Consumer spending <sup>2,3</sup>	3.6	4.4	0.8
<b>Prices and earnings</b>			
GDP deflator	1.5	2.3	0.8
RPI (September)	1.7	2.0	0.3
CPI (September)	0.6	1.0	0.4
Whole economy earnings growth	3.0	2.9	-0.1
<b>Other key fiscal determinants</b>			
Claimant count (millions) <sup>4</sup>	0.74	0.78	0.0
Employment (millions)	31.6	31.8	0.2
VAT gap (per cent) <sup>5</sup>	11.5	9.7	-1.8
<b>Financial and property sectors</b>			
Equity prices (FTSE All-share index)	3337	3700	363
HMRC financial sector profits <sup>1,3,5,6</sup>	3.5	4.1	0.6
Residential property prices <sup>7</sup>	5.7	6.2	0.5
Residential property transactions (000s)	1257	1155	-102
Commercial property prices <sup>8</sup>	2.1	-12.0	-14.1
Commercial property transactions <sup>8</sup>	-0.9	6.1	7.0
<b>Oil and gas</b>			
Oil prices (\$ per barrel) <sup>3</sup>	35.5	44.0	8.5
Oil prices (£ per barrel) <sup>3</sup>	24.9	32.5	7.6
Gas prices (p/therm) <sup>3</sup>	29.9	34.6	4.7
Oil production (million tonnes) <sup>3</sup>	43.2	47.4	4.2
Gas production (billion therms) <sup>3</sup>	13.0	14.5	1.5
<b>Interest rates</b>			
Market short-term interest rates (per cent) <sup>9</sup>	0.5	0.4	-0.1
Market gilt rates (per cent) <sup>10</sup>	1.7	1.2	-0.5
Euro/Sterling exchange rate	1.28	1.19	-0.09
<sup>1</sup> Not seasonally adjusted.	<sup>6</sup> HMRC Gross Case 1 trading profits		
<sup>2</sup> Nominal.	<sup>7</sup> Outturn data from ONS House Price Index.		
<sup>3</sup> Calendar year.	<sup>8</sup> Outturn data (ex. Scotland) from HMRC <i>Annual stamp tax statistics</i> .		
<sup>4</sup> UK seasonally-adjusted claimant count.	<sup>9</sup> 3-month sterling interbank rate (LIBOR).		
<sup>5</sup> No outturn available, latest forecast from March 2016	<sup>10</sup> Weighted average interest rate on conventional gilts.		

Table A.7: Breakdown of March 2015 receipts forecast differences for 2016-17

	£ billion						
	Forecast	Outturn	Difference	of which:			
				Classification changes	Policy changes	Economic factors	Fiscal forecast difference
Income tax (gross of tax credits)	182.0	177.2	-4.7	0.0	1.9	0.2	-6.9
<i>of which:</i>							
Pay as you earn (PAYE)	153.6	149.7	-3.9	0.0	-1.1	-0.8	-2.0
Self assessment (SA)	29.3	28.5	-0.8	0.0	2.7	1.2	-4.7
National insurance contributions	123.9	125.9	2.1	0.0	-0.3	-0.6	2.9
Value added tax	117.7	121.6	3.9	0.0	0.4	0.3	3.2
Corporation tax	43.6	54.1	10.5	4.6	0.7	0.9	4.3
<i>of which:</i>							
Onshore	42.9	53.5	10.6	4.3	0.8	0.9	4.7
Offshore	0.7	0.6	-0.1	0.3	-0.1	0.0	-0.3
Petroleum revenue tax	-0.1	-0.7	-0.5	0.0	-0.1	0.1	-0.5
Fuel duties	27.2	27.9	0.8	0.0	-0.4	0.3	0.9
Business rates	29.0	29.4	0.4	0.0	-0.6	0.0	1.0
Council tax	28.8	30.4	1.5	0.0	0.4	0.0	1.1
VAT refunds	13.2	13.8	0.6	0.0	0.0	0.8	-0.2
Capital gains tax	7.3	8.4	1.1	0.0	0.2	-1.0	1.9
Inheritance tax	4.6	4.8	0.2	0.0	0.0	0.0	0.2
Stamp duties <sup>1</sup>	15.2	15.6	0.4	0.0	1.1	-0.3	-0.4
<i>of which:</i>							
Stamp duty land tax <sup>1</sup>	11.8	11.9	0.1	0.0	1.1	0.0	-1.0
Stamp duty on shares	3.4	3.7	0.3	0.0	0.0	-0.3	0.6
Tobacco duties	9.0	8.7	-0.3	0.0	0.0	0.0	-0.3
Alcohol duties	10.8	11.1	0.3	0.0	-0.1	0.0	0.4
Air passenger duty	3.2	3.2	0.0	0.0	0.0	0.0	0.1
Insurance premium tax	3.1	4.9	1.8	0.0	1.5	-0.1	0.4
Climate change levy	2.0	1.9	0.0	0.0	0.5	0.0	-0.5
Other HMRC taxes <sup>2</sup>	6.6	7.4	0.7	0.0	0.0	0.2	0.5
<i>of which:</i>							
Landfill tax <sup>2</sup>	0.8	0.8	0.1	0.0	0.0	0.0	0.1
Aggregates levy	0.3	0.4	0.1	0.0	0.0	0.0	0.1
Betting and gaming duty	2.6	2.7	0.1	0.0	0.0	0.0	0.2
Customs duties	3.0	3.4	0.4	0.0	0.0	0.2	0.2
Vehicle excise duties	5.6	5.8	0.2	0.0	0.0	0.0	0.2
Bank levy	3.8	3.0	-0.8	0.0	-0.5	0.0	-0.3
Bank surcharge	0.0	1.6	1.6	0.5	0.9	0.0	0.2
BBC licence fee receipts	3.1	3.2	0.1	0.0	0.0	0.0	0.1
Environmental levies	6.8	5.2	-1.6	-1.4	0.0	0.0	-0.3
EU ETS auction receipts	0.3	0.4	0.0	0.0	0.0	0.1	0.0
Scottish taxes <sup>3</sup>	0.6	0.6	0.0	0.0	0.0	0.0	0.0
Other taxes	5.4	7.2	1.8	1.0	0.0	-0.2	0.9
<b>National accounts taxes</b>	<b>652.7</b>	<b>672.7</b>	<b>20.0</b>	<b>4.8</b>	<b>5.6</b>	<b>0.5</b>	<b>9.1</b>
less own resources EU contributions	-2.2	-3.4	-1.2	0.0	0.0	0.0	-1.2
Interest & dividends	7.8	6.0	-1.8	0.0	-0.2	-1.0	-0.6
Gross operating surplus	48.8	47.2	-1.6	0.0	0.0	0.0	-1.5
Other receipts	1.5	3.7	2.2	0.8	0.0	0.0	1.3
<b>Current receipts</b>	<b>708.6</b>	<b>726.2</b>	<b>17.6</b>	<b>5.6</b>	<b>5.5</b>	<b>-0.5</b>	<b>7.1</b>

<sup>1</sup> Excludes Scottish LBTT.<sup>2</sup> Excludes Scottish LFT.<sup>3</sup> Consists of Scottish LBTT and LFT but not the Scottish rate of income tax or AGL.

Table A.8: Breakdown of March 2016 receipts forecast differences for 2016-17

	£ billion						
	Forecast	Outturn	Difference	of which:			
				Classification changes	Policy changes	Economic factors	Fiscal forecast difference
Income tax (gross of tax credits)	182.1	177.2	-4.9	0.0	0.0	-0.1	-4.8
<i>of which:</i>							
Pay as you earn (PAYE)	153.4	149.7	-3.6	0.0	0.0	-0.1	-3.6
Self assessment (SA)	30.2	28.5	-1.6	0.0	0.0	0.0	-1.6
National insurance contributions	126.5	125.9	-0.5	0.0	0.0	-0.1	-0.4
Value added tax	120.1	121.6	1.6	0.0	0.0	-0.1	1.6
Corporation tax	43.5	54.1	10.7	4.6	0.0	2.0	4.0
<i>of which:</i>							
Onshore	43.4	53.5	10.1	4.3	0.0	1.4	4.4
Offshore	0.1	0.6	0.5	0.3	0.0	0.6	-0.3
Petroleum revenue tax	-1.1	-0.7	0.5	0.0	0.0	0.3	0.2
Fuel duties	27.6	27.9	0.3	0.0	0.0	-0.2	0.5
Business rates	28.4	29.4	1.0	0.0	0.0	0.0	1.0
Council tax	30.1	30.4	0.3	0.0	0.0	0.0	0.3
VAT refunds	14.7	13.8	-0.9	0.0	0.0	-0.1	-0.8
Capital gains tax	7.0	8.4	1.4	0.0	0.0	0.2	1.2
Inheritance tax	4.8	4.8	0.1	0.0	0.0	0.2	-0.1
Stamp duties <sup>1</sup>	15.9	15.6	-0.3	0.0	0.0	-0.1	-0.2
<i>of which:</i>							
Stamp duty land tax <sup>1</sup>	12.9	11.9	-0.9	0.0	0.0	-0.4	-0.6
Stamp duty on shares	3.0	3.7	0.7	0.0	0.0	0.3	0.4
Tobacco duties	9.2	8.7	-0.5	0.0	0.0	0.0	-0.5
Alcohol duties	10.9	11.1	0.2	0.0	0.0	0.0	0.1
Air passenger duty	3.2	3.2	0.0	0.0	0.0	0.0	0.0
Insurance premium tax	4.6	4.9	0.3	0.0	0.0	-0.3	0.6
Climate change levy	2.1	1.9	-0.2	0.0	0.0	0.0	-0.2
Other HMRC taxes <sup>2</sup>	7.0	7.4	0.4	0.0	0.0	0.0	0.3
<i>of which:</i>							
Landfill tax <sup>2</sup>	0.9	0.8	-0.1	0.0	0.0	0.0	-0.1
Aggregates levy	0.4	0.4	0.1	0.0	0.0	0.0	0.1
Betting and gaming duty	2.6	2.7	0.1	0.0	0.0	0.0	0.1
Customs duties	3.1	3.4	0.3	0.0	0.0	0.1	0.2
Vehicle excise duties	5.5	5.8	0.3	0.0	0.0	0.0	0.3
Bank levy	2.9	3.0	0.1	0.0	0.0	0.0	0.1
Bank surcharge	0.8	1.6	0.8	0.5	0.0	0.2	0.1
BBC licence fee receipts	3.1	3.2	0.1	0.0	0.0	0.0	0.1
Environmental levies	7.3	5.2	-2.2	-1.9	0.0	0.0	-0.3
EU ETS auction receipts	0.5	0.4	-0.1	0.0	0.0	0.0	-0.1
Scottish taxes <sup>3</sup>	0.6	0.6	0.0	0.0	0.0	0.0	0.0
Other taxes	7.9	7.2	-0.7	0.2	0.0	-0.1	-0.8
<b>National accounts taxes</b>	<b>665.1</b>	<b>672.7</b>	<b>7.6</b>	<b>3.4</b>	<b>0.0</b>	<b>2.0</b>	<b>2.2</b>
less own resources EU contributions	-3.3	-3.4	-0.1	0.0	0.0	0.0	-0.1
Interest & dividends	5.7	6.0	0.3	0.0	0.0	0.0	0.4
Gross operating surplus	47.8	47.2	-0.6	0.0	0.0	0.0	-0.6
Other receipts	2.0	3.7	1.7	0.8	0.0	0.0	0.8
<b>Current receipts</b>	<b>717.3</b>	<b>726.2</b>	<b>8.9</b>	<b>4.3</b>	<b>0.0</b>	<b>1.9</b>	<b>2.7</b>

<sup>1</sup> Excludes Scottish LBTT.<sup>2</sup> Excludes Scottish LFT.<sup>3</sup> Consists of Scottish LBTT and LFT but not the Scottish rate of income tax or AGL.



Table A.9: Breakdown of March 2015 spending forecast differences for 2016-17

	£ billion						
	Forecast	Outturn	Difference	of which:			
				Classification changes	Policy changes	Economic factors	Fiscal forecast difference
<b>Public sector current expenditure (PSCE)</b>							
PSCE in RDEL	293.2	312.5	19.3	0.0	19.3	0.0	0.0
PSCE in AME, of which:	381.2	380.1	-1.1	-2.7	-2.3	-2.0	5.9
Welfare spending, of which:	219.5	216.9	-2.6	0.0	-2.5	0.5	-0.5
Inside the Welfare Cap	121.0	118.7	-2.2	0.0	-2.5	0.0	0.2
Outside the Welfare Cap	98.5	98.2	-0.3	0.0	0.0	0.4	-0.7
Company and other tax credits	2.5	3.0	0.5	0.0	0.0	0.0	0.5
Net public service pension payments	11.2	11.2	-0.1	0.0	0.1	-0.1	0.0
of which:							
CG unfunded pension schemes	9.2	8.8	-0.4	0.0	0.1	-0.1	-0.3
LG police and fire pension schemes	2.1	2.4	0.3	0.0	0.0	0.0	0.3
National lottery current grants	1.3	1.4	0.1	0.0	0.0	0.0	0.1
BBC current expenditure	3.8	3.7	-0.1	0.0	0.0	0.0	-0.1
Network Rail other current expenditure	0.7	0.8	0.1	-0.2	0.0	0.0	0.3
Other PSCE items in departmental AME	1.1	0.5	-0.6	-0.1	0.0	0.0	-0.5
Expenditure transfers to EU institutions	9.4	8.8	-0.6	0.0	0.0	0.0	-0.6
Locally financed current expenditure <sup>1</sup>	40.0	45.1	5.1	0.0	0.1	0.0	5.0
CG net debt interest, of which:	40.4	35.5	-4.9	0.0	0.0	-3.2	-1.7
CG gross debt interest	50.7	48.7	-2.1	0.0	0.0	-2.2	0.1
less APF holdings of CG debt	-10.4	-13.2	-2.8	0.0	0.0	-1.1	-1.7
General government depreciation	31.2	29.9	-1.4	0.0	0.0	0.1	-1.5
Current VAT refunds	10.9	12.0	1.1	0.0	0.0	0.8	0.3
Public corporations' debt interest	3.9	3.4	-0.4	0.0	0.0	0.0	-0.4
Single use military expenditure	0.2	0.0	-0.2	-0.2	0.0	0.0	0.0
Environmental levies	6.7	5.3	-1.4	-1.4	0.0	0.0	-0.1
Local authority imputed pensions <sup>2</sup>	2.1	0.5	-1.6	-1.7	0.0	0.0	0.1
CG imputed pensions <sup>2</sup>	0.0	0.9	0.9	0.9	0.0	0.0	0.0
Other National Accounts adjustments	-3.8	1.2	5.0	0.0	0.0	0.0	5.0
<b>Total public sector current expenditure</b>	<b>674.4</b>	<b>692.6</b>	<b>18.2</b>	<b>-2.7</b>	<b>17.0</b>	<b>-2.0</b>	<b>5.9</b>
<b>Public sector gross investment (PSGI)</b>							
PSGI in CDEL	45.4	45.8	0.4	-0.3	0.7	0.0	0.0
PSGI in AME, of which:	31.4	32.8	1.4	0.0	-0.1	0.0	1.5
National lottery capital grants	0.5	0.5	-0.1	0.0	0.0	0.0	-0.1
Network Rail capital expenditure	5.9	6.6	0.7	0.0	0.0	0.0	0.7
Other PSGI items in departmental AME	0.4	0.7	0.3	0.0	0.0	0.0	0.3
Locally financed capital expenditure	8.1	8.8	0.7	0.0	-0.1	0.0	0.8
Public corporations' capital expenditure	16.2	17.1	0.9	0.0	0.0	0.0	0.9
Other National Accounts adjustments	0.3	-0.8	-1.1	0.0	0.0	0.0	-1.1
<b>Total public sector gross investment</b>	<b>76.8</b>	<b>78.6</b>	<b>1.8</b>	<b>-0.3</b>	<b>0.6</b>	<b>0.0</b>	<b>1.5</b>
Less public sector depreciation	-42.2	-40.8	1.4	0.0	0.0	-0.1	1.6
<b>Public sector net investment</b>	<b>34.6</b>	<b>37.9</b>	<b>3.2</b>	<b>-0.3</b>	<b>0.6</b>	<b>-0.1</b>	<b>3.1</b>
<b>Total managed expenditure<sup>1</sup></b>	<b>751.3</b>	<b>771.3</b>	<b>20.0</b>	<b>-2.9</b>	<b>17.6</b>	<b>-2.0</b>	<b>7.4</b>

<sup>1</sup> All spending outturns are provisional and subject to change.

<sup>2</sup> Imputed employer pension contributions related to funded public sector pension schemes. The classification changes include fundamental changes in methodology, which ONS introduced in the September 2017 release of the Public Finance Statistics.

Table A.10: Breakdown of March 2016 spending forecast differences for 2016-17

	£ billion						
	Forecast	Outturn	Difference	of which:			
				Classification changes	Policy changes	Economic factors	Fiscal forecast difference
<b>Public sector current expenditure (PSCE)</b>							
<b>PSCE in RDEL</b>	313.8	312.5	-1.3	0.2	1.7	0.0	-3.2
<b>PSCE in AME, of which:</b>	380.7	380.1	-0.6	-3.2	0.2	1.4	1.0
Welfare spending, of which:	218.3	216.9	-1.3	0.0	0.1	0.3	-1.7
Inside the Welfare Cap	119.8	118.7	-1.1	0.0	0.1	0.1	-1.4
Outside the Welfare Cap	98.4	98.2	-0.2	0.0	0.0	0.2	-0.4
Company and other tax credits	2.6	3.0	0.4	0.0	0.0	0.0	0.4
Net public service pension payments	11.2	11.2	0.0	0.0	0.0	0.0	0.0
of which:							
CG unfunded pension schemes	9.0	8.8	-0.2	0.0	0.0	0.0	-0.2
LG police and fire pension schemes	2.2	2.4	0.2	0.0	0.0	0.0	0.2
National lottery current grants	1.4	1.4	0.0	0.0	0.0	0.0	0.0
BBC current expenditure	3.8	3.7	-0.2	0.0	0.0	0.0	-0.2
Network Rail other current expenditure	0.8	0.8	0.1	-0.2	0.0	0.0	0.3
Other PSCE items in departmental AME	0.9	0.5	-0.4	-0.1	0.0	0.0	-0.4
Expenditure transfers to EU institutions	11.8	8.8	-3.0	0.0	0.0	-0.1	-2.9
Locally financed current expenditure <sup>1</sup>	40.8	45.1	4.3	0.0	0.0	0.0	4.3
CG net debt interest, of which:	35.4	35.5	0.1	0.0	0.0	1.1	-1.0
CG gross debt interest	47.8	48.7	0.9	0.0	0.0	0.9	-0.1
less APF holdings of CG debt	-12.4	-13.2	-0.8	0.0	0.0	0.1	-0.9
General government depreciation	31.1	29.9	-1.3	0.0	0.0	0.3	-1.6
Current VAT refunds	12.4	12.0	-0.3	0.0	0.0	-0.1	-0.2
Public corporations' debt interest	3.6	3.4	-0.2	0.0	0.0	0.0	-0.2
Single use military expenditure	0.2	0.0	-0.2	-0.2	0.0	0.0	0.0
Environmental levies	7.3	5.3	-2.0	-1.9	0.0	0.0	-0.1
Local authority imputed pensions <sup>2</sup>	1.9	0.5	-1.4	-1.7	0.0	0.0	0.3
CG imputed pensions <sup>2</sup>	0.0	0.9	0.9	0.9	0.0	0.0	0.0
Other National Accounts adjustments	-2.8	1.2	4.0	0.0	0.0	0.0	4.0
<b>Total public sector current expenditure</b>	<b>694.5</b>	<b>692.6</b>	<b>-1.9</b>	<b>-2.9</b>	<b>1.8</b>	<b>1.4</b>	<b>-2.2</b>
<b>Public sector gross investment (PSGI)</b>							
<b>PSGI in CDEL</b>	46.0	45.8	-0.2	0.0	-0.9	0.0	0.7
<b>PSGI in AME, of which:</b>	32.8	32.8	0.1	-0.9	0.0	0.0	1.0
National lottery capital grants	0.5	0.5	0.0	0.0	0.0	0.0	0.0
Network Rail capital expenditure	6.9	6.6	-0.3	0.0	0.0	0.0	-0.3
Other PSGI items in departmental AME	0.6	0.7	0.1	0.0	0.0	0.0	0.1
Locally financed capital expenditure	6.9	8.8	1.9	0.0	0.0	0.0	1.9
Public corporations' capital expenditure	17.0	17.1	0.1	0.0	0.0	0.0	0.1
Tax litigation <sup>3</sup>	0.9	0.0	-0.9	-0.9	0.0	0.0	0.0
Other National Accounts adjustments	0.0	-0.8	-0.8	0.0	0.0	0.0	-0.8
<b>Total public sector gross investment</b>	<b>78.8</b>	<b>78.6</b>	<b>-0.1</b>	<b>-0.9</b>	<b>-0.9</b>	<b>0.0</b>	<b>1.7</b>
<b>Less public sector depreciation</b>	<b>-41.7</b>	<b>-40.8</b>	<b>0.9</b>	<b>0.0</b>	<b>0.0</b>	<b>-0.4</b>	<b>1.3</b>
<b>Public sector net investment</b>	<b>37.1</b>	<b>37.9</b>	<b>0.8</b>	<b>-0.9</b>	<b>-0.9</b>	<b>-0.4</b>	<b>3.0</b>
<b>Total managed expenditure<sup>1</sup></b>	<b>773.3</b>	<b>771.3</b>	<b>-2.0</b>	<b>-3.8</b>	<b>0.9</b>	<b>1.4</b>	<b>-0.5</b>

<sup>1</sup> All spending outturns are provisional and subject to change.

<sup>2</sup> Imputed employer pension contributions related to funded public sector pension schemes. The classification changes include fundamental changes in methodology, which ONS introduced in the September 2017 release of the Public Finance Statistics.

<sup>3</sup> In our July 2015 forecast, we switched our tax litigation payments forecast from negative receipts to spending, in line with ESA10 National Accounts guidelines. See Box 4.1 of our July 2015 EFO for more information.

Table A.11: Breakdown of March 2015 welfare spending differences for 2016-17

	£ billion						
	Forecast	Outturn	Difference	of which:			
				Classification changes	Policy changes	Economic factors	Fiscal forecast difference
<b>Welfare cap<sup>1</sup></b>							
DWP social security <sup>2</sup>	75.3	76.0	0.7	0.3	-1.6	0.0	2.0
<i>of which:</i>							
Housing benefit (not on JSA)	22.5	21.3	-1.2	-0.2	-1.1	0.0	0.1
Disability living allowance and personal independence payments	14.9	16.7	1.8	0.0	0.0	0.0	1.8
Incapacity benefits <sup>3</sup>	14.7	15.1	0.4	-0.1	0.0	0.0	0.5
Attendance allowance	5.6	5.5	-0.1	0.0	-0.1	0.0	0.0
Pension credit	5.8	5.6	-0.2	0.0	-0.1	0.1	-0.2
Carer's allowance	2.5	2.7	0.1	0.0	0.0	0.0	0.1
Statutory maternity pay	2.3	2.2	-0.1	0.0	0.0	0.0	-0.2
Income support (non-incapacity)	2.6	2.3	-0.3	-0.1	0.0	0.0	-0.2
Winter fuel payments	2.1	2.0	0.0	0.0	0.0	0.0	0.0
Universal credit <sup>4</sup>	-0.1	0.5	0.6	0.8	-0.3	0.0	0.1
Other DWP in welfare cap	2.4	2.2	-0.2	0.0	0.0	0.0	-0.2
Personal tax credits	29.8	27.4	-2.3	-0.2	-0.2	0.1	-2.0
Child benefit	11.6	11.6	0.0	0.0	0.0	0.0	0.1
Tax free childcare	0.7	0.0	-0.7	0.0	-0.7	0.0	0.0
NI social security in welfare cap <sup>5</sup>	3.4	3.5	0.1	0.0	0.0	0.0	0.1
Paternity pay	0.1	0.1	0.0	0.0	0.0	0.0	0.0
<b>Total welfare cap</b>	<b>121.0</b>	<b>118.7</b>	<b>-2.2</b>	<b>0.0</b>	<b>-2.5</b>	<b>0.0</b>	<b>0.2</b>
<b>Welfare spending outside the welfare cap<sup>1</sup></b>							
DWP social security <sup>2</sup>	96.1	95.9	-0.2	0.0	0.0	0.4	-0.6
<i>of which:</i>							
State pension	92.0	91.6	-0.4	0.0	0.0	0.2	-0.6
Jobseeker's allowance	2.4	1.9	-0.5	-0.6	0.0	0.1	0.1
Housing benefit (on JSA)	1.7	1.6	-0.2	-0.4	0.0	0.1	0.1
Universal credit <sup>4</sup>	0.0	1.1	1.1	1.1	0.0	0.1	0.0
NI social security outside welfare cap <sup>5</sup>	2.4	2.3	-0.2	0.0	0.0	0.0	-0.2
<b>Total welfare spending outside the welfare cap</b>	<b>98.5</b>	<b>98.2</b>	<b>-0.3</b>	<b>0.0</b>	<b>0.0</b>	<b>0.4</b>	<b>-0.7</b>
<b>Total welfare</b>	<b>219.5</b>	<b>216.9</b>	<b>-2.6</b>	<b>0.0</b>	<b>-2.5</b>	<b>0.5</b>	<b>-0.5</b>

<sup>1</sup> Forecasts include estimates of the marginal effect of universal credit relative to the existing benefits and tax credits systems, whereas all spending in outturn is on a full-cost basis.

<sup>2</sup> Provisional outturns for some DWP benefits use different sources to the aggregate totals.

<sup>3</sup> Incapacity benefits includes incapacity benefit, employment and support allowance, severe disablement allowance and income support (incapacity part).

<sup>4</sup> Universal credit additional costs not already included against other benefits (i.e. UC payments that don't exist under current benefit structure).

<sup>5</sup> An allocation of error between categories is not available, so we assume all errors are fiscal forecasting errors.

Table A.12: Breakdown of March 2016 welfare spending differences for 2016-17

	£ billion						
	Forecast	Outturn	Difference	of which:			
				Classification changes	Policy changes	Economic factors	Fiscal forecast difference
<b>Welfare cap<sup>1</sup></b>							
DWP social security <sup>2</sup>	76.1	76.0	0.0	0.4	0.0	0.0	-0.4
<i>of which:</i>							
Housing benefit (not on JSA)	21.7	21.3	-0.4	-0.2	0.0	0.0	-0.2
Disability living allowance and personal independence payments	16.4	16.7	0.3	0.0	0.0	0.0	0.3
Incapacity benefits <sup>3</sup>	14.9	15.1	0.2	-0.1	0.0	0.0	0.4
Attendance allowance	5.5	5.5	0.0	0.0	0.0	0.0	0.0
Pension credit	5.8	5.6	-0.1	0.0	0.0	0.0	-0.1
Carer's allowance	2.7	2.7	-0.1	0.0	0.0	0.0	-0.1
Statutory maternity pay	2.4	2.2	-0.2	0.0	0.0	0.0	-0.2
Income support (non-incapacity)	2.4	2.3	-0.1	-0.1	0.0	0.0	0.0
Winter fuel payments	2.1	2.0	0.0	0.0	0.0	0.0	0.0
Universal credit <sup>4</sup>	-0.1	0.5	0.6	0.8	0.0	0.0	-0.2
Other DWP in welfare cap	2.4	2.2	-0.3	0.0	0.0	0.0	-0.3
Personal tax credits	28.5	27.4	-1.1	-0.2	0.1	0.1	-1.1
Child benefit	11.7	11.6	0.0	0.0	0.0	0.0	0.0
Tax free childcare	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NI social security in welfare cap <sup>5</sup>	3.5	3.5	0.0	0.0	0.0	0.0	0.0
Paternity pay	0.1	0.1	0.0	0.0	0.0	0.0	0.0
<b>Total welfare cap</b>	<b>119.9</b>	<b>118.7</b>	<b>-1.1</b>	<b>0.0</b>	<b>0.1</b>	<b>0.1</b>	<b>-1.4</b>
<b>Welfare spending outside the welfare cap<sup>1</sup></b>							
DWP social security <sup>2</sup>	96.0	95.9	-0.1	0.0	0.0	0.2	-0.2
<i>of which:</i>							
State pension	91.7	91.6	-0.1	0.0	0.0	0.0	-0.1
Jobseeker's allowance	2.5	1.9	-0.6	-0.7	0.0	0.1	0.0
Housing benefit (on JSA)	1.8	1.6	-0.3	-0.4	0.0	0.1	0.1
Universal credit <sup>4</sup>	0.0	1.1	1.1	1.1	0.0	0.0	-0.1
NI social security outside welfare cap <sup>5</sup>	2.4	2.3	-0.2	0.0	0.0	0.0	-0.2
<b>Total welfare spending outside the welfare cap</b>	<b>98.4</b>	<b>98.2</b>	<b>-0.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.2</b>	<b>-0.4</b>
<b>Total welfare</b>	<b>218.3</b>	<b>216.9</b>	<b>-1.3</b>	<b>0.0</b>	<b>0.1</b>	<b>0.3</b>	<b>-1.7</b>

<sup>1</sup> Forecasts include estimates of the marginal effect of universal credit relative to the existing benefits and tax credits systems, whereas all spending in outturn is on a full-cost basis.

<sup>2</sup> Provisional outturns for some DWP benefits use different sources to the aggregate totals.

<sup>3</sup> Incapacity benefits includes incapacity benefit, employment and support allowance, severe disablement allowance and income support (incapacity part).

<sup>4</sup> Universal credit additional costs not already included against other benefits (i.e. UC payments that don't exist under current benefit structure).

<sup>5</sup> An allocation of error between categories is not available, so we assume all errors are fiscal forecasting errors.

Table A.13: Adjustments to receipts and spending forecasts for ESA10, PSF review and housing associations classification decisions

	£ billion										
	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21
<b>Receipts</b>											
June 2010	20.3	21.5	23.8	25.0	26.4	27.6					
November 2010	20.2	20.2	22.2	23.4	24.9	26.1					
March 2011	20.1	20.3	22.2	23.4	24.8	25.9					
November 2011		20.3	22.0	23.3	24.7	25.9	26.0				
March 2012		21.2	22.9	24.3	25.8	27.0	27.2				
December 2012			22.9	23.9	24.7	24.5	23.6	23.4			
March 2013			22.0	22.9	23.8	24.0	23.5	23.7			
December 2013				22.9	23.9	25.1	24.4	23.6	23.9		
March 2014				22.7	24.3	25.2	24.5	23.7	24.0		
December 2014					7.7	8.1	7.7	7.5	7.4	7.2	
March 2015					7.7	8.1	7.7	7.5	7.4	7.2	
July 2015					7.7	8.1	7.7	7.5	7.4	7.2	7.7
November 2015						0.9	0.9	0.9	0.8	0.8	0.9
March 2016						0.9	0.9	0.9	0.8	0.8	0.9
<b>Spending</b>											
June 2010	20.0	20.5	29.2	18.7	22.4	21.7					
November 2010	19.9	19.2	27.6	17.1	20.9	20.3					
March 2011	19.8	19.3	27.6	17.1	20.8	20.1					
November 2011		19.3	27.4	17.0	20.8	20.1	21.1				
March 2012		19.2	27.3	16.9	20.7	20.0	21.1				
December 2012			27.2	16.4	19.6	17.5	17.5	16.2			
March 2013			26.3	15.4	18.7	17.0	17.4	16.6			
December 2013				15.5	18.8	18.1	18.3	16.5	18.2		
March 2014				15.3	19.2	18.2	18.4	16.5	18.3		
December 2014					11.3	9.2	11.0	11.4	11.7	11.1	
March 2015					11.3	9.2	11.0	11.4	11.7	11.1	
July 2015					11.3	9.2	11.0	11.4	11.7	11.1	11.5
November 2015						0.9	1.3	1.3	1.3	1.2	1.3
March 2016						0.9	1.3	1.3	1.3	1.2	1.3

Our forecasts from June 2010 to March 2014 have been restated for ESA10 and PSF review classification changes.

Our forecasts from June 2010 to March 2016 have also been restated for the reclassification of 'private registered providers' of social housing from the private to the public corporations sector. See chapter 3 for more detail.

Table A.14: Restated receipts and spending forecasts for ESA10, PSF review and housing associations classification decisions

	£ billion										
	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21
<b>Receipts</b>											
June 2010	568.0	605.7	645.8	686.8	726.4	764.5					
November 2010	569.8	606.4	642.5	682.5	722.8	760.7					
March 2011	568.6	608.9	641.9	683.7	722.2	760.4					
November 2011		595.7	616.3	646.8	682.1	719.4	761.2				
March 2012		591.6	614.5	646.8	684.2	719.0	762.4				
December 2012			605.2	632.2	657.1	687.9	723.1	757.6			
March 2013			602.4	623.1	645.8	673.1	711.5	745.3			
December 2013				629.5	658.4	690.4	729.6	763.9	800.7		
March 2014				630.3	660.8	693.4	732.5	766.6	801.7		
December 2014					653.5	678.4	713.5	744.2	776.7	810.2	
March 2015					654.6	675.5	708.6	738.7	771.8	811.5	
July 2015					654.0	681.0	718.8	751.2	785.3	821.5	863.8
November 2015						683.1	724.3	763.6	797.4	831.9	872.8
March 2016						682.7	717.3	746.7	780.4	821.7	853.1
<b>Spending</b>											
June 2010	716.8	720.4	740.2	740.7	760.0	779.2					
November 2010	718.1	722.9	738.9	736.5	753.9	773.2					
March 2011	714.2	729.7	747.8	747.2	764.5	783.9					
November 2011		721.9	741.9	740.1	757.1	766.7	779.8				
March 2012		715.6	738.7	736.9	754.2	764.0	777.4				
December 2012			729.5	736.3	750.5	762.2	772.6	781.4			
March 2013			727.6	735.5	749.1	761.7	772.3	780.8			
December 2013				733.3	749.3	762.2	774.5	780.2	792.8		
March 2014				730.7	751.2	761.6	770.9	776.0	791.2		
December 2014					748.4	755.4	757.6	762.6	777.0	791.0	
March 2015					748.4	751.9	751.3	755.3	770.9	808.4	
July 2015					746.9	751.5	765.3	779.4	796.0	815.5	856.0
November 2015						756.6	774.7	788.8	802.4	822.2	858.6
March 2016						754.8	773.3	785.9	802.2	811.7	842.5

Our forecasts from June 2010 to March 2014 have been restated for ESA10 and PSF review classification changes.

Our forecasts from June 2010 to July 2015 have also been restated for the reclassification of 'private registered providers' of social housing from the private to the public corporations sector. See chapter 3 for more detail.

Table A.15: Adjustments to PSNB forecast for ESA10, PSF review and housing associations classification decisions

	£ billion										
	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21
<b>Public sector net borrowing</b>											
June 2010	-0.2	-1.0	5.4	-6.4	-3.9	-5.8					
November 2010	-0.2	-1.0	5.4	-6.4	-3.9	-5.8					
March 2011	-0.2	-1.0	5.4	-6.4	-3.9	-5.8					
November 2011		-1.0	5.4	-6.4	-3.9	-5.8	-4.9				
March 2012		-2.1	4.4	-7.5	-5.1	-7.0	-6.1				
December 2012			4.4	-7.5	-5.1	-7.0	-6.1	-7.1			
March 2013			4.4	-7.5	-5.1	-7.0	-6.1	-7.1			
December 2013				-7.5	-5.1	-7.0	-6.1	-7.1	-5.7		
March 2014				-7.5	-5.1	-7.0	-6.1	-7.1	-5.7		
December 2014					3.7	1.1	3.3	3.9	4.3	3.9	
March 2015					3.7	1.1	3.3	3.9	4.3	3.9	
July 2015					3.7	1.1	3.3	3.9	4.3	3.9	3.9
November 2015						-0.1	0.4	0.4	0.4	0.4	0.4
March 2016						-0.1	0.4	0.4	0.4	0.4	0.4

Our forecasts from June 2010 to March 2014 have been restated for ESA10 and PSF review classification changes.

Our forecasts from June 2010 to July 2015 have also been restated for the reclassification of 'private registered providers' of social housing from the private to the public corporations sector. See chapter 3 for more detail.

Table A.16: Restated PSNB forecast for ESA10, PSF review and housing associations classification decisions

	£ billion										
	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21
<b>Public sector net borrowing</b>											
June 2010	148.9	114.6	94.5	53.7	33.5	14.6					
November 2010	148.3	116.4	96.4	53.8	31.1	12.4					
March 2011	145.7	120.8	106.0	63.5	42.3	23.5					
November 2011		126.1	125.6	93.1	75.0	47.3	18.6				
March 2012		123.9	124.3	90.0	69.9	45.0	15.0				
December 2012			124.3	104.0	93.5	74.3	49.5	23.8			
March 2013			125.3	112.3	103.3	88.6	60.9	35.5			
December 2013				103.7	90.9	71.7	45.0	16.3	-7.9		
March 2014				100.3	90.4	68.2	38.4	9.4	-10.5		
December 2014					94.9	77.0	44.2	18.5	0.3	-19.2	
March 2015					93.8	76.4	42.7	16.7	-0.9	-3.1	
July 2015					92.8	70.6	46.4	28.2	10.7	-6.1	-7.7
November 2015						73.4	50.4	25.2	5.0	-9.7	-14.3
March 2016						72.1	55.9	39.2	21.9	-10.0	-10.6

Our forecasts from June 2010 to March 2014 have been restated for ESA10 and PSF review classification changes.

Our forecasts from June 2010 to July 2015 have also been restated for the reclassification of 'private registered providers' of social housing from the private to the public corporations sector. See chapter 3 for more detail.

## B Comparison with past official forecasts

- B.1** This annex compares the difference between the OBR's various fiscal forecasts and the latest outturns with the average differences in official forecasts over the previous 20 years.
- B.2** This exercise provides some guide to relative forecast performance, but with significant limitations. Most fundamentally, these comparisons are often influenced by factors beyond those under the control of the forecaster in question. For example, we may be looking at periods in which the underlying behaviour of the public finances was inherently more or less predictable, in which the size and distribution of unforeseeable shocks was different, or in which policymakers responded differently when the public finances diverged from expectations. And we have not yet had to forecast through a recession, which is often when the largest forecast differences arise – because their timing and depth are so uncertain.
- B.3** We have so far produced 16 forecasts, but the sample that we can compare against outturns is still relatively small – especially at longer time horizons. We can compare only seven of our forecasts at a 4-year horizon and five at a 5-year horizon.
- B.4** In addition to the public finances, we also undertake this comparison for our forecasts of real GDP growth. As we have emphasized throughout this report, real GDP is not the most important economic determinant of the public finances, but it is the measure that most outside commentators focus on when judging the performance of macroeconomic forecasts.
- B.5** For what it is worth, our forecast differences for real GDP and net borrowing have, more often than not, been smaller than the average differences in official forecasts over the 20 years before the OBR was created.

### Real GDP growth

- B.6** Table B.1 shows our forecast differences for real GDP growth. Not surprisingly, when comparing the absolute difference between forecast periods, the expected difference for forecasts two years ahead is greater than for one year ahead, and for one year ahead is greater than in-year estimates. One would expect forecasts to be more accurate at short horizons than long ones – the closer the forecaster is to the event, the more data are available and the easier it should be to forecast. However, this information advantage can be complicated by data revisions, which are often substantial, multiple, and continue long after the event.



## Comparison with past official forecasts

**B.7** When measured in percentage point terms as in Table B.1, the accuracy of real GDP growth forecasts will also be affected by the path of GDP growth itself. In periods of relatively stable growth, forecast differences are likely to be smaller. For example, GDP growth was roughly in line with the final years of our June 2010 forecast despite the long time horizon, because output growth in those years (2014 and 2015) was relatively stable and relatively close to its assumed potential growth rate in those years.

**B.8** Relatively few years in the 15 forecasts evaluated in Table B.1 show large differences between our real GDP growth forecasts and outturn. Those that do include:

- Our **June 2010 and November 2010 forecasts** were both over-optimistic regarding GDP growth in 2012, failing to foresee the intensification of the euro crisis and the dampening effect on real GDP growth at a time when those forecasts assumed a gathering pace of recovery. Only by late 2011 did we (and most other forecasters) significantly revise down our expectations for GDP growth in 2012.
- Our **November 2011** forecast proved particularly optimistic regarding GDP growth in 2016. It assumed that growth would be boosted by significant amounts as spare capacity was brought back into productive use on top of an assumed potential growth rate of 2.3 per cent. In the event, 2016 saw GDP growth slow to 1.8 per cent, with both potential output and cyclical factors weaker than assumed in that forecast.
- Our **December 2012 forecast** was too pessimistic relative to the latest estimate of growth in 2012. That was despite the fact that initial estimates of GDP growth were available for the first three quarters of 2012 at the time. Much of the in-year forecast difference reflects data revisions. For example, data at the time reported three consecutive quarters of falling GDP between the end of 2011 and the second quarter of 2012, whereas the latest data report only one quarter of falling output.
- Our **March 2013 forecast** was too pessimistic regarding growth in 2013 and 2014. As well as the latest data showing more momentum in the economy than was evident in the data available at the time, there were a number of policy developments that may have supported output growth by more than we had assumed – including, for example, the President of the European Central Bank’s confidence-boosting commitment to ‘do whatever it takes’ to protect the euro.

Table B.1: Forecast differences for real GDP growth

	Per cent					
	Calendar years ahead					
	In-year	One	Two	Three	Four	Five
June 2010	0.5	-0.8	-1.3	-0.8	0.4	-0.4
November 2010	-0.1	-0.6	-1.1	-0.8	0.3	-0.4
March 2011	-0.2	-1.0	-0.8	0.2	-0.5	
November 2011	0.6	0.8	0.0	0.4	-0.7	-1.2
March 2012	0.7	0.1	0.4	-0.7	-1.2	
December 2012	1.6	0.9	1.1	0.0	-0.9	
March 2013	1.5	1.3	0.0	-0.9		
December 2013	0.7	0.7	0.1	-0.8		
March 2014	0.4	0.0	-0.8			
December 2014	0.1	-0.1	-0.4			
March 2015	-0.2	-0.5				
July 2015	-0.1	-0.5				
November 2015	-0.1	-0.6				
March 2016	-0.2					
November 2016	-0.3					
Average absolute differences over the 20 years preceding the creation of the OBR						
Spring/summer	0.8	1.1	1.3	1.1	1.3	n/a
Autumn	0.7	1.0	1.1	1.2	1.2	1.0
Smaller than average absolute difference		Average sized difference		Bigger than average absolute difference		

## Public sector net borrowing

**B.9** Nominal GDP has been revised up significantly in recent years, in particular in the 2014 Blue Book that brought the National Accounts into line with the 2010 European System of Accounts (ESA10). Changes to the level of GDP do not greatly affect our interpretation of how the public finances have evolved, but the revisions have reduced the ratios of fiscal measures expressed as a share of GDP. This makes comparisons of forecasts expressed on that basis hard to interpret, so in this annex we:

- compare **cash borrowing** (Table B.2) and **cash spending** (Table B.3) forecast differences normalised by the latest GDP estimates; and
- present our forecasts for the **change in receipts as a share of GDP** against outturns over time, which abstracts from changes in the level caused by revisions to the denominator (Table B.4).

**B.10** Less than a fifth of our PSNB forecasts show larger forecast differences than the average over the preceding 20 years (Table B.2). These larger differences include:

- Our **first three forecasts for 2012-13 to 2015-16** were too optimistic, with November 2010 particularly so. This largely reflected lower-than-expected tax receipts. In particular, the productivity-related weakness in earnings growth, as well as policy changes to raise the income tax personal allowance faster than inflation, put downward pressure on the effective tax rate.
- Our **in-year forecasts for 2010-11 and 2011-12** were too pessimistic. This reflected a number of factors, in particular local authority net borrowing. Relative to our forecasts

## Comparison with past official forecasts

at the time, local authorities added to their reserves rather than running them down, but this only became apparent much later when solid data became available. More timely quarterly data are now available to inform our forecasts.

- Our **recent forecasts for 2016-17** have been too pessimistic. This was partly related to significant revisions to in-year data, as set out in Box 3.1 in Chapter 3.

**B.11 Cash spending forecast differences** have consistently been smaller than the average of the previous 20 years (Table B.3). The larger under-estimates for spending in 2016-17 in some forecasts – particularly December 2014 and March 2015 – reflect the Conservative Government’s Summer Budget 2015 decision not to carry out the sharp cuts to departmental spending that had been pencilled in by the Coalition Government before the 2015 general election. The larger over-estimates for 2012-13 in some earlier forecasts – notably March 2011 – reflect the Treasury’s decision to clamp down on departmental spending late in 2012-13 in order to ensure that borrowing fell in cash terms that year.

**B.12** More of our **receipts forecast differences** have been relatively large by historical standards, with around a quarter of the years shown in Table B.4 recording above-average forecast differences. These have tended largely to reflect weakness in income tax and NICs receipts, where a less tax-rich composition of labour earnings (through higher employment but weaker average earnings) and policy changes (including successive increases in the income tax personal allowance) have reduced effective tax rates. As set out above, our recent receipts forecasts for 2016-17 have tended to be too pessimistic.

**B.13** The fact that forecast differences in our receipts and spending forecasts have often been partly offsetting, but with larger differences in receipts than spending, is consistent with the analysis of our fiscal forecast revisions presented in Annex B of our March 2016 *Economic and fiscal outlook (EFO)*. In it, we noted that:

- **Revisions to receipts forecasts tend to be bigger than revisions to spending forecasts.** In absolute terms, receipts revisions have averaged 0.5 per cent of GDP, more than twice the average spending revision of 0.2 per cent of GDP. That is as one might expect, since most receipts are linked to the performance of the economy, whereas around half of public spending (i.e. DELs) is in effect fixed in cash terms.
- **Revisions to receipts forecasts are typically offset to some extent by revisions to debt interest spending forecasts.** There have only been three forecasts where changes in receipts and debt interest have contributed in the same direction to the overall revision to borrowing. It should come as no surprise that receipts and debt interest forecast changes tend to offset each other since both are likely to be driven by the same underlying factors. In particular, market expectations of future interest rates, which drive our debt interest forecast, will tend to fall/rise when market participants’ expectations of future growth prospects are lowered/raised. If we share that interpretation – as will often be the case – we are likely to revise down/up our nominal GDP growth and receipts forecasts.

Table B.2: Forecast differences for cash PSNB

	Per cent of outturn GDP					
	Fiscal years ahead					
	In-year	One	Two	Three	Four	Five
June 2010 <sup>1</sup>	0.1	-0.6	0.0	1.7	2.6	3.3
November 2010	-0.6	0.0	1.6	2.6	3.4	3.3
March 2011	-0.4	-0.3	1.0	2.1	2.8	2.8
November 2011	-0.6	-0.1	0.4	1.0	1.5	1.6
March 2012	-0.6	-0.1	0.5	1.2	1.5	1.8
December 2012	-0.1	-0.3	-0.1	0.0	0.0	
March 2013	-0.2	-0.7	-0.6	-0.8	-0.5	
December 2013	-0.3	0.1	0.1	0.3		
March 2014	-0.1	0.1	0.3	0.6		
December 2014	-0.1	-0.1	0.3			
March 2015	-0.1	-0.1	0.4			
July 2015 <sup>1</sup>	0.0	0.2	0.2			
December 2015	0.1	0.0	0.0			
March 2016	0.1	-0.3				
November 2016	-0.9					
March 2017	-0.3					
Average absolute differences over the 20 years preceding the creation of the OBR						
Spring/summer	0.3	0.9	1.9	2.9	3.2	3.6
Autumn	0.5	1.3	2.0	2.2	2.8	3.2

<sup>1</sup> For comparability, 'in-year' is assumed to be 2009-10 and 2014-15 for the June 2010 and July 2015 forecasts respectively.

Note: Forecast differences have been adjusted to reflect major ONS classification changes. This includes the 2014 changes related to ESA10 and the PSF review, the reclassification of 'private registered providers' of social housing into the public sector and the 2017 change to the accounting treatment of corporation tax receipts.

Smaller than average absolute difference      Average sized difference      Bigger than average absolute difference

Table B.3: Forecast differences for cash spending

	Per cent of outturn GDP					
	Fiscal years ahead					
	In-year	One	Two	Three	Four	Five
June 2010 <sup>1</sup>	0.5	0.0	-0.2	-0.3	-0.2	-0.3
November 2010	-0.1	-0.4	-0.3	-0.1	-0.1	-0.8
March 2011	0.2	-0.8	-0.9	-0.7	-0.6	-1.3
November 2011	-0.3	-0.5	-0.3	-0.3	-0.4	-0.3
March 2012	0.0	-0.3	-0.1	-0.1	-0.3	-0.2
December 2012	0.2	-0.1	0.0	-0.3	-0.1	
March 2013	0.3	-0.1	0.1	-0.3	-0.1	
December 2013	0.0	0.1	-0.3	-0.2		
March 2014	0.2	0.0	-0.3	0.0		
December 2014	0.1	0.1	0.7			
March 2015	0.1	0.2	1.0			
July 2015 <sup>1</sup>	0.2	0.3	0.3			
December 2015	0.0	-0.2				
March 2016	0.1	-0.1				
November 2016	-0.4					
March 2017	-0.1					
Average absolute differences over the 20 years preceding the creation of the OBR						
Spring/summer	1.1	1.0	1.1	1.5	1.8	2.0
Autumn	0.9	0.7	0.9	1.1	1.7	2.3

<sup>1</sup> For comparability, 'in-year' is assumed to be 2009-10 and 2014-15 for the June 2010 and July 2015 forecasts respectively.

Smaller than average absolute difference      Average sized difference      Bigger than average absolute difference

## Comparison with past official forecasts

Table B.4: Forecast differences for changes in receipts as a share of GDP

	Per cent of GDP					
	Fiscal years ahead					
	In-year	One	Two	Three	Four	Five
June 2010 <sup>1</sup>	-0.1	0.4	0.1	-1.1	-1.5	-1.8
November 2010	0.6	0.4	-0.7	-1.0	-1.3	-1.0
March 2011	0.4	0.0	-0.8	-1.2	-1.5	-1.2
November 2011	0.0	-0.7	-0.8	-1.0	-0.8	-0.2
March 2012	0.3	-0.5	-0.8	-1.1	-0.7	-0.3
December 2012	-0.7	-1.1	-1.3	-1.2	-0.7	
March 2013	-0.8	-1.0	-1.1	-1.0	-0.8	
December 2013	0.3	0.0	-0.1	0.0		
March 2014	0.3	0.1	-0.1	0.2		
December 2014	0.2	0.4	0.4			
March 2015	0.1	0.6	0.6			
July 2015 <sup>1</sup>	0.1	-0.2	-0.2			
December 2015	0.2	0.0				
March 2016	-0.4	-0.5				
November 2016	0.5					
March 2017	0.5					
Average absolute differences over the 20 years preceding the creation of the OBR						
Spring/summer	0.5	0.8	1.0	1.1	1.0	1.0
Autumn	0.5	0.7	1.0	0.9	0.9	0.9

<sup>1</sup> For comparability, 'in-year' is assumed to be 2009-10 and 2014-15 for the June 2010 and July 2015 forecasts respectively.

Note: Forecast differences have been adjusted to reflect major ONS classification changes. This includes the 2014 changes related to ESA10 and the PSF review, the reclassification of 'private registered providers' of social housing into the public sector and the 2017 change to the accounting treatment of corporation tax receipts.

Smaller than average absolute difference      Average sized difference      Bigger than average absolute difference

## Using historical forecast differences to illustrate uncertainty

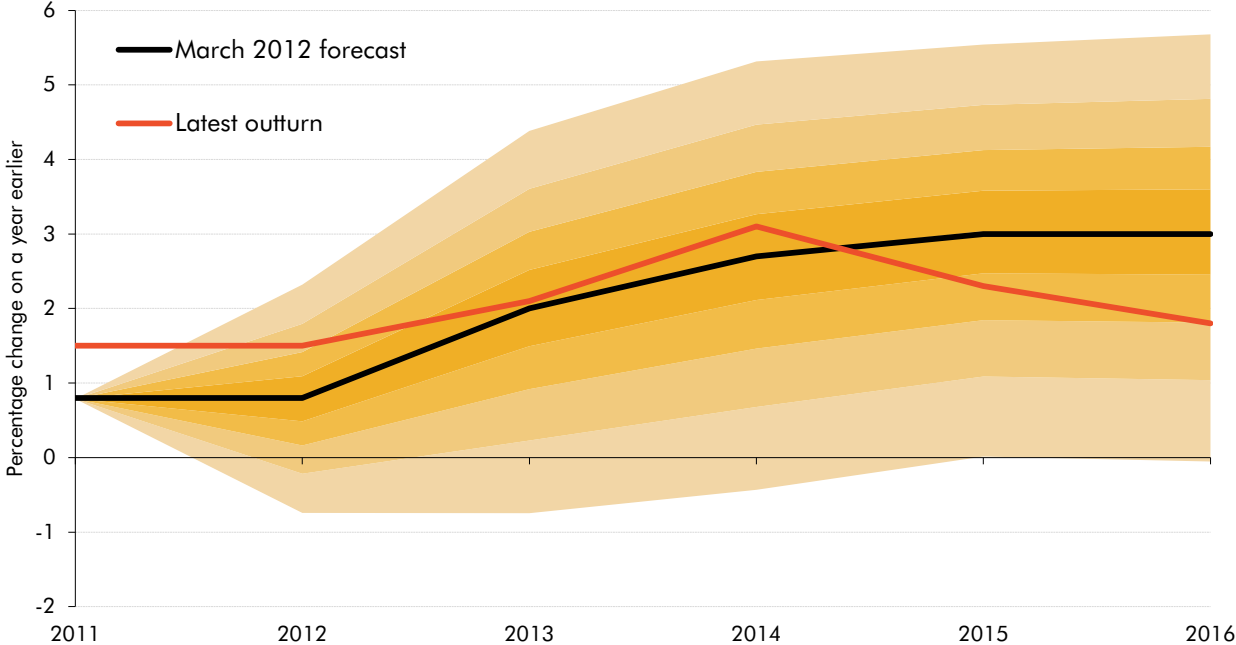
**B.14** In our forecast publications, we routinely illustrate the uncertainty surrounding our central forecast using fan charts. These fan charts do not represent our assessment of specific risks to the central forecast. Instead, they use the analysis set out above to show the outcomes that someone might anticipate if they believed that forecast differences in the past offered a reasonable guide to likely differences in the future.

**B.15** Charts B.1 and B.2 set out the fan charts we presented in our March 2012 *EFO*, our first March forecast for which the fifth year of the forecast period was 2016-17. The probability distributions underpinning those fan charts would have implied:

- around a 1-in-3 chance of **real GDP growth** in 2016 being as low as it was in outturn or lower; and
- similarly, around a 1-in-3 chance of **PSNB** in 2016-17 being as high as it was in outturn or higher.

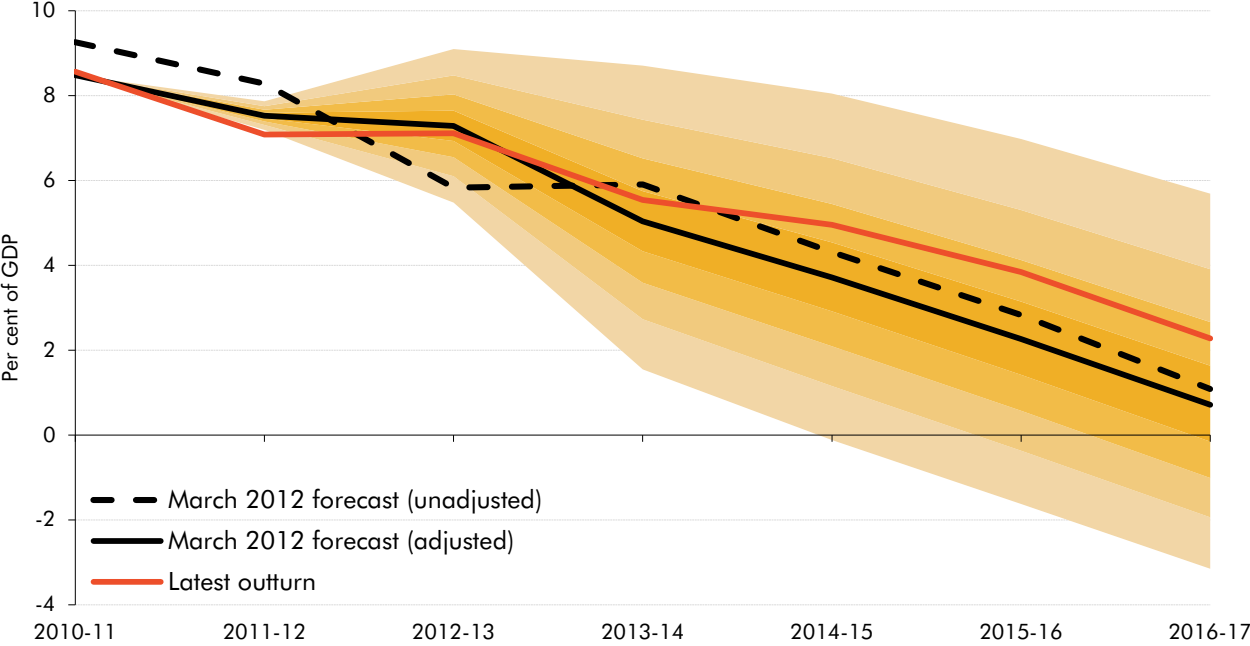
**B.16** In line with the approach we use elsewhere in our evaluation, we have adjusted our original PSNB forecast for fiscal classification changes and revisions to the level of nominal GDP. The unadjusted forecast is also shown in Chart B.2, illustrating the scale of these changes.

Chart B.1: Real GDP fan chart



Source: ONS, OBR

Chart B.2: PSNB fan chart



Source: ONS, OBR



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