

Office for
**Budget
Responsibility**

Forecast evaluation report

October 2023

Office for Budget Responsibility: Forecast evaluation report

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October 2023



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Foreword

The Office for Budget Responsibility was created in 2010 to provide independent and authoritative analysis of the UK public finances. Twice a year – usually at the time of each Budget and Autumn or Spring Statement – we publish a set of forecasts for the economy and 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 its fiscal targets.

In each *EFO*, we stress the uncertainty that lies around all such forecasts. We compare our central forecasts to those of other forecasters. We highlight the limited confidence that should be placed in our central forecast given the scale of shocks that inevitably drive a wedge between any central predictions and subsequent outcomes. We use sensitivity and scenario analysis to show how the public finances could be affected by alternative economic outcomes. And we highlight the residual uncertainties in the public finances, even if one were confident about the path for the economy – for example, because of uncertain estimates of the cost of policy measures.

Notwithstanding these uncertainties, we believe that it is important to set out our forecast in detail. It is also important to examine regularly how our forecasts compare to outturn data and to explain any discrepancies so that we can learn from our experience.

Our annual *Forecast evaluation report* enables us to reflect on the reasons for divergence between our central forecast and the subsequent outturns. To a significant extent these differences between outturns and previous forecasts are inevitable given the inherent difficulty in forecasting the path of the economy and the consequent effect on the public finances, which has been amplified recently by unforecastable shocks that hit the economy. But some differences are due to genuine errors, which would have been corrected before the forecast was finalised if we had spotted them. When we identify them, we describe them as such. Errors of this sort are inevitable from time to time in a highly disaggregated forecasting exercise like ours.

This year our report analyses the performance of our March 2021 and March 2022 economic forecasts for the 2022-23 financial year. Over this period, higher energy, food and other prices following the Russian invasion of Ukraine led to a moderation in real demand and higher inflation than expected.

This year, we have also published a working paper taking a comprehensive look at our overall forecasting record since the OBR was established in 2010. It compares our economic and fiscal forecasts against those of external UK forecasters, the Bank of England, other official forecasters in Europe, and the official UK forecasts produced by the Treasury during the 20 years before the OBR

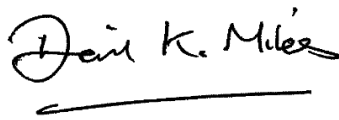
Foreword

was established.¹ The direction of forecast differences examined in this *FER* mirror those identified in that more comprehensive piece of analysis, namely a tendency to overestimate real GDP growth and underestimate government borrowing.

We provided a final copy of this report to the Treasury two working days in advance of publication. This timing was extended in recent changes to our *Memorandum of Understanding* with HM Treasury and our main forecasting departments.



Richard Hughes



Professor David Miles CBE



Tom Josephs

The Budget Responsibility Committee

¹ OBR, Working paper No.19: *The OBR's forecast performance*, 2023.

1 Executive summary

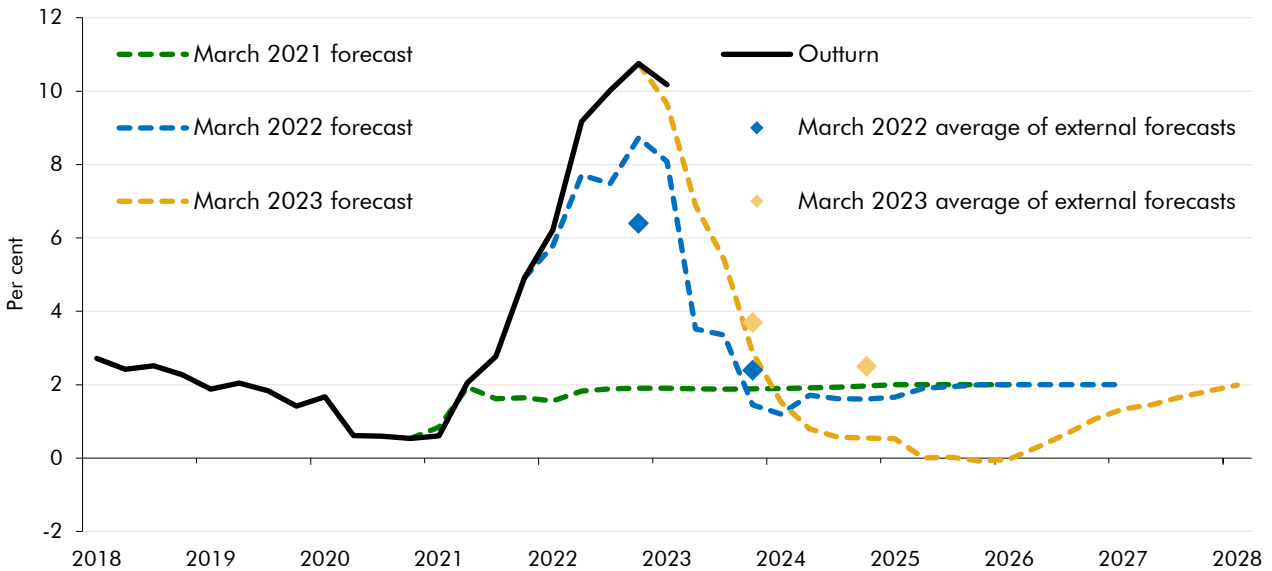
- 1.1 The focus of this year's *Forecast evaluation report (FER)* is the performance of our forecasts for the financial year 2022-23. The almost unprecedented fall and recovery in the economic activity caused by the covid pandemic in the previous two years, was followed in 2022-23 by the Russian invasion of Ukraine in February 2022. The war led to a spike in global gas (and oil) prices that compounded UK inflationary pressures that had already been building due to supply bottlenecks and a tightening labour market in the wake of the pandemic.
- 1.2 Against this backdrop, our March 2021 forecast (made a year before the Russian invasion) and March 2022 forecast (made within a few weeks of the invasion) significantly underestimated the strength and persistence of inflation, and overestimated the level of economic activity. The upward surprise in inflation greatly exceeded the shortfall in GDP and led to nominal GDP growth – the key determinant of tax receipts – outpacing both March forecasts. This led to significantly higher nominal tax receipts than we had expected. But higher inflation and the associated fiscal and monetary policy response, in the form of welfare and energy costs support and higher Bank Rate, pushed up spending and debt interest by even more. As a result, we underestimated borrowing in 2022-23 which, at £128.4 billion (5.1 per cent of GDP) was £21.5 billion (0.8 per cent of GDP) above our March 2021 and £29.3 billion (1.2 per cent of GDP) above March 2022 forecasts.

Explaining our 2022-23 economy forecast differences

Inflation

- 1.3 The extent of the CPI inflation overshoot in 2022-23 is the largest difference between forecast and outturn since the OBR began forecasting in 2010 (Chart 1.1). CPI inflation was 8.2 percentage points higher than we forecast in March 2021 and 2.0 percentage points higher than our March 2022 forecast. We identified in our January 2023 *Forecast evaluation report (FER)* several explanations for this overshoot including: an unexpectedly strong recovery in demand in advanced economies, pushing up against persistent supply and logistics bottlenecks; rising energy costs; and a tighter post-pandemic labour market than we had anticipated. In this *FER* we have re-considered our assumptions about the speed and size of pass-through of higher energy prices into wider consumer prices, which our latest analysis now suggests have also been too low.

Chart 1.1: Successive inflation forecasts



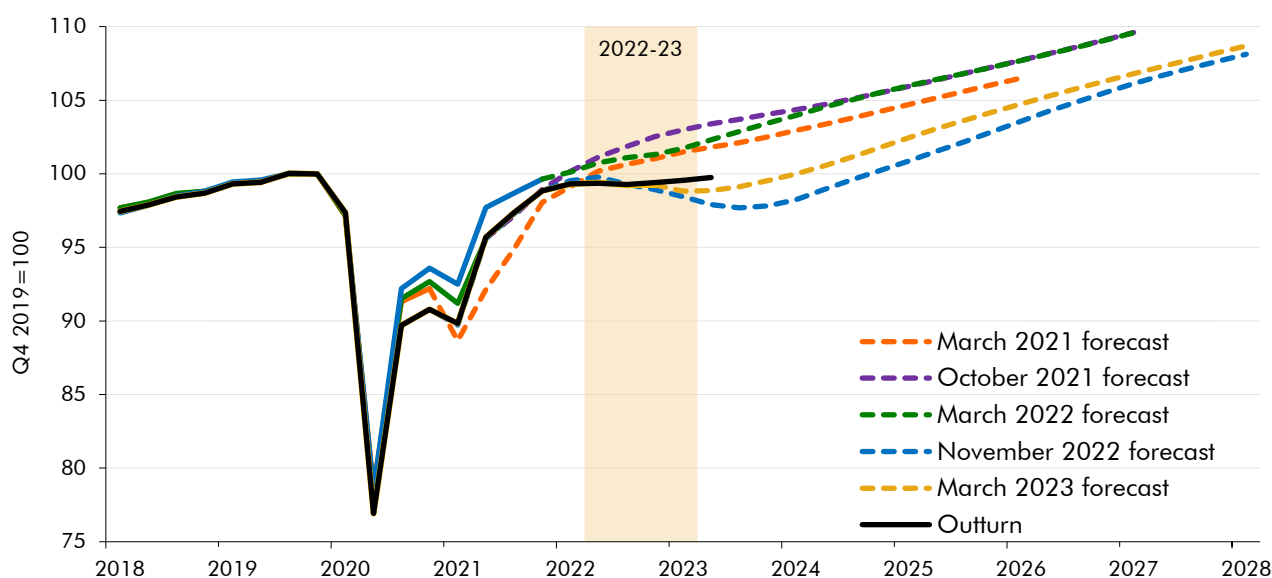
Note: Average of independent forecasts newly submitted to HMT's *Forecasts for the UK economy* at the time of each *Economic and fiscal outlook* publication.
 Source: HMT, ONS, OBR

GDP

1.4 Based on ONS estimates available at the time of writing this report, our March 2021 and 2022 forecasts overestimated real GDP growth in 2022-23 by 3.3 and 0.6 percentage points respectively, as rising energy prices and global supply bottlenecks weighed on UK productivity.¹ The associated increase in consumer prices has eroded real wages and led to much larger increases in interest rates than financial markets expected, which have reduced growth in consumption and investment relative to our forecasts. Living standards, as measured by real household disposable income per capita, fell by 1.9 per cent in 2022-23, the largest fall in any single financial year since ONS records began in 1956-57. This was a much worse outcome than the 0.8 per cent rise anticipated in our March 2021 forecast but close to the 2.2 per cent fall expected in our March 2022 forecast.

¹ This report was written before the release of the Q2 2023 Quarterly National Accounts that are consistent with the 2023 Blue Book on 29 September.

Chart 1.2: Successive forecasts for the level of real GDP



Note: Outturn is consistent with the first estimate of GDP for the second quarter of 2023, so does not take into account the revisions that (when this report went to print) were due to be incorporated in the 29 September Quarterly National Accounts.

Source: ONS, OBR

Labour market and productivity

1.5 Labour supply growth in 2022-23, measured in terms of total hours worked, was 2.2 and 0.6 percentage points less than estimated in both the March 2021 and March 2022 forecasts respectively. This undershoot mainly reflects a significant overestimation of average hours worked, which did not recover to pre-pandemic levels as swiftly as had been expected following the closure of the furlough scheme. The outturn for annual employment growth in 2022-23 was 0.3 and 0.1 percentage points higher than expected in the March 2021 and March 2022 forecasts. This resulted in the unemployment rate falling faster than expected, undershooting both the March 2021 and March 2022 forecasts by 2.0 and 0.3 percentage points respectively.

1.6 Productivity growth was 1.2 percentage points weaker than expected in the March 2021 forecast, which overestimated GDP growth by 3.3 percentage points in 2022-23 but total hours growth by only 2.2 percentage points. Both were revised lower in the March 2022 forecast, which predicted no growth in productivity, and ended up much closer to the 0.1 per cent outturn. The weakness in productivity growth over the year suggests that the post-pandemic rebound in total factor productivity may not have been as strong as expected.

Nominal GDP

1.7 Stronger-than-expected growth in the GDP deflator meant our March 2021 forecast underestimated cumulative growth in nominal GDP from 2020-21 to 2022-23, despite cumulative real GDP growth turning out weaker than expected. The surprise was driven by much stronger growth in nominal consumption (contributing 5.1 percentage points of the

total difference of 8.3 percentage points) supported on the income side by stronger-than-expected growth in employees' compensation (5.1 percentage points higher).

- 1.8 A similar story holds for our March 2022 forecast, with higher inflation outweighing weaker real GDP growth. Nominal consumption again accounts for most of the additional growth (1.3 out of 1.9 percentage points), but this time on the income side the forecast difference is more than explained by much stronger-than-anticipated growth in corporate profits (as measured in the National Accounts).

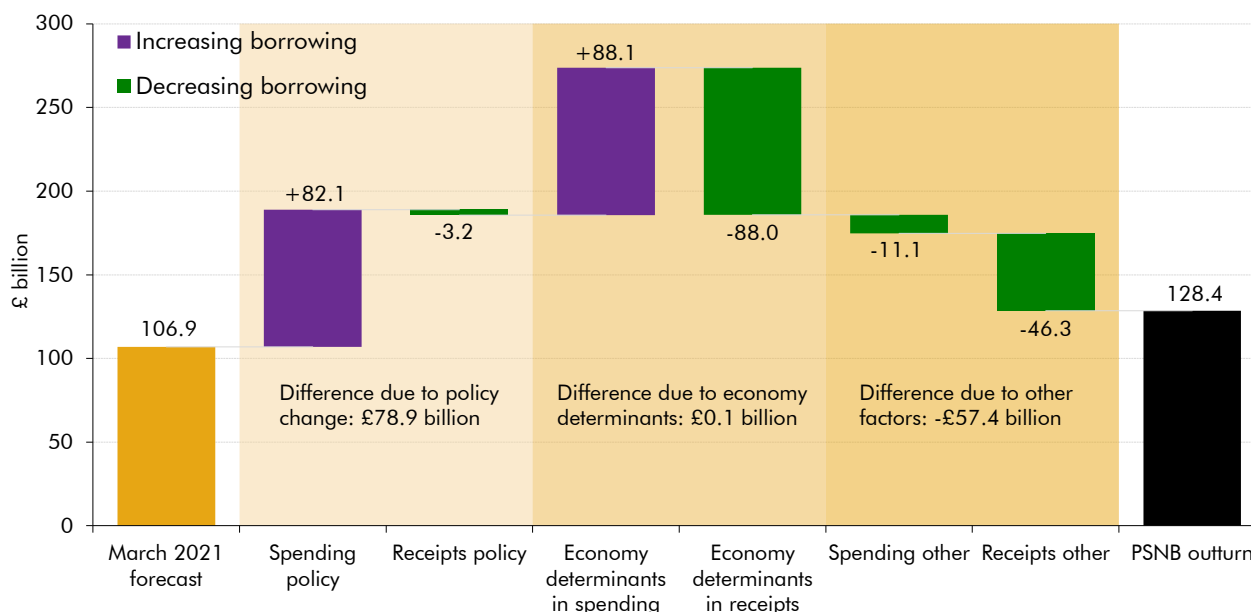
Explaining our 2022-23 fiscal forecast differences

- 1.9 These nominal GDP surprises provide a partial explanation for government borrowing in 2022-23 coming in £21.5 billion (0.8 per cent of GDP) above our March 2021 forecast and £29.3 billion (1.2 per cent of GDP) above our March 2022 forecast. For both our March 2021 and March 2022 forecasts, higher-than-expected receipts were more than offset by higher-than-expected spending, resulting in higher borrowing by the end of the financial year.

March 2021 borrowing forecast

- 1.10 Against our **March 2021 forecast**, borrowing came in £21.5 billion higher than expected. Of this overall difference (summarised in Chart 1.3):
- **Economic factors** were neutral with large differences in tax receipts (£88.0 billion) and spending (£88.1 billion) almost exactly offsetting each other. Both effects are in large part due to higher-than-anticipated inflation.
 - **Policy changes** drove up borrowing by £78.9 billion due primarily to the Energy Price Guarantee and other support provided to help households and businesses to cope with the sudden rise in the cost of energy following the Russian invasion of Ukraine.
 - **Other factors** reduced borrowing by £57.4 billion. These factors drive a £46.3 billion underestimate of receipts, including due to differences in the effective tax rate of corporation tax, and a £11.1 billion overestimate in spending.

Chart 1.3: March 2021 PSNB error for 2022-23 by source



Note: 'Spending other' and 'Receipts other' includes differences due to classification changes.

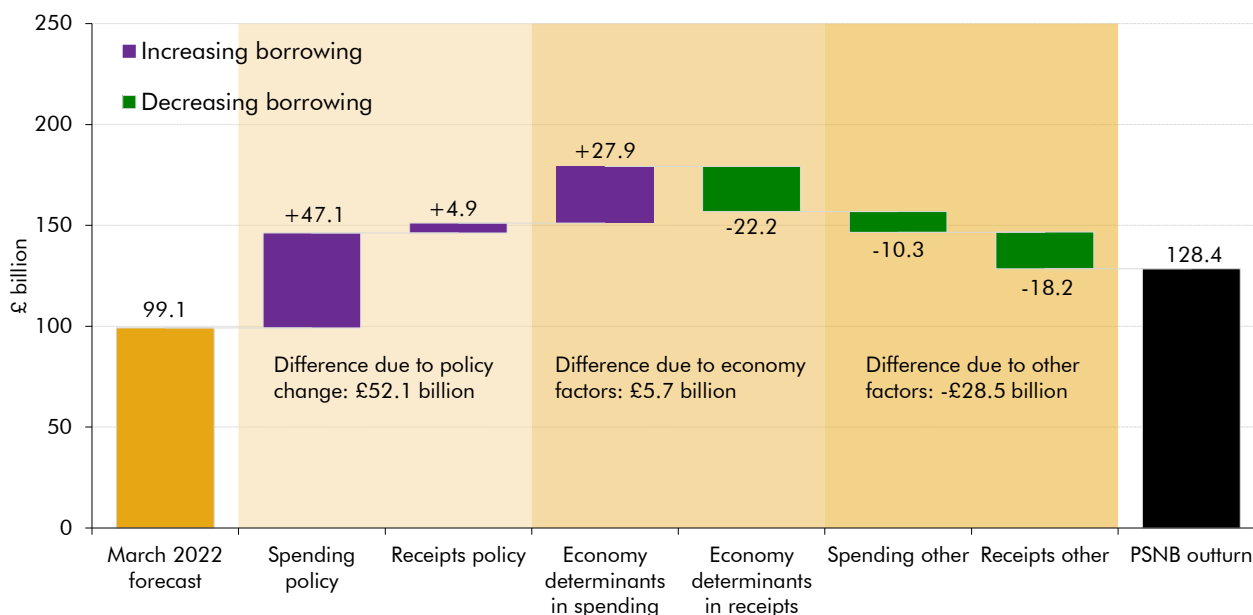
Source: ONS, OBR

March 2022 borrowing forecast

1.11 Our **March 2022 forecast** also underestimated borrowing by £29.3 billion. Of this overall difference (summarised in Chart 1.4):

- **Economic factors** make up £5.7 billion of the overall PSNB error. £27.9 billion of the difference was due to higher spending – mainly from the underestimate of the inflation uplift acting on index-linked government debt and Bank Rate on payments made from the Asset Purchase Facility. This was partly offset by £22.2 billion of underestimated receipts from faster growth in tax bases and lower welfare spending (£0.6 billion).
- **Policy changes** make up £52.1 billion of total PSNB error. £47.1 billion (90 per cent) was due to new spending policies – particularly on energy support schemes and cost-of-living payments (£8.4 billion). £4.9 billion was due to lower receipts, in particular the cancellation of NICs rate rise after 7 months.
- **Other factors** reduced borrowing by £28.5 billion: £10.3 billion lower spending than anticipated and £18.2 billion higher receipts. The unexplained receipts overshoot was mostly in onshore corporation tax where the effective tax rate has been much stronger than anticipated in March 2022's forecast.

Chart 1.4: March 2022 PSNB error for 2022-23 by source



Note: 'Spending other' and 'Receipts other' includes differences due to classification changes.
Source: ONS, OBR

Public sector net debt

1.12 The level of public sector net debt (PSND) was 98.0 per cent of GDP in 2022-23. This was 10.4 percentage points lower than forecast in March 2021 but 2.5 percentage points above our March 2022 forecast. This reflects:

- **Nominal GDP**, which was £176.7 billion (7.3 per cent) higher than expected in March 2021 and contributed around 7.4 percentage points of the undershoot. Our March 2022 forecast underestimated nominal GDP by £20.4 billion, reducing the size of the overall overshoot by 0.8 percentage points.
- **Cash debt at the end of 2021-22** was £117.7 billion lower than forecast in March 2021, representing 4.5 percentage points of the undershoot relating to that forecast. It was £52.8 billion higher than forecast in March 2022, 2.0 percentage points of the overshoot.
- **Debt accumulation through 2022-23** was higher than forecast in both March 2021 and March 2022, raising debt relative to both forecasts by 1.5 and 1.2 percentage points respectively.

Refining our forecasts

1.13 As was the case with the Covid pandemic, forecasting the impact of the Russian invasion of Ukraine was always likely to be challenging, given the lack of recent historical precedent to draw on. In terms of how we responded to these shocks and the lessons we can learn:

- For our economy forecast, **we have re-examined the effect of previous historical energy price shocks on inflation**. The UK economy is much less energy intensive than at the time of the last extreme rises in energy prices in the 1970s. While our forecasts took that into account, it seems that the indirect effect of energy prices on inflation may have been greater than we expected. We will incorporate the evidence of this stronger energy price pass through in our November 2023 forecast. The relative resilience of real household disposable income has also prompted us to review the pass-through of rises in Bank Rate to household disposable incomes.
- On the fiscal side, the main 2022-23 forecast differences can be explained by economic factors. Of the remaining differences, the key lessons learnt are:
 - (a) The **receipts** overshoot against both the March 2021 and 2022 forecasts reinforces the importance of looking at nominal as well as real economy trends. In-year receipts have recently been stronger than indicated by latest data for key nominal tax bases, particularly for onshore corporation tax. Early ONS data on profits is very provisional, so we have put more focus on sectoral trends and the source of differences (e.g. payments from very large companies compared with those from small companies).
 - (b) The October 2021 Spending Review led to a £39.5 billion (1.6 per cent of GDP) increase in our **departmental spending** forecast. This has been a frequent source of difference between our spending forecasts and outturn, caused when governments replace the indicative aggregate spending plans with detailed department-by-department spending limits at Spending Reviews. We will reflect on the implications of this pattern of government behaviour in our upcoming November 2023 *EFO*.

1.14 We also undertake an annual **review of our economic and fiscal forecasting models**. This year, on the economic side, we have focussed on improving our inflation modelling by enhancing the range of statistical models to produce our short-term forecast and our medium-term models for tradables inflation and wage growth. On the fiscal side we have published an updated 'model assessment database' on our website alongside this *FER*, which reviews progress against previously identified priorities, and outlines new priorities for 2023. Those priorities include a deeper understanding of the self-assessment income tax base, and the development of a new onshore corporation tax model for our November 2023 forecast, given that receipts have been much stronger than expected.

2 The economy

Introduction

- 2.1 This chapter assesses the performance of our March 2021 and March 2022 economic forecasts for the 2022-23 financial year, a period that saw the UK economy suffer the consequences of the February 2022 Russian invasion of Ukraine and associated rise in energy, food, and other prices.
- 2.2 Our March 2021 forecast was finalised one year before the invasion of Ukraine (and 8 months before Russia began to tighten its gas supplies to Europe) and can therefore be thought of as a counterfactual for what might have happened if the invasion had not taken place. Many of the most significant differences between this pre-invasion forecast and outturn therefore represent the consequences of the invasion itself.
- 2.3 Our March 2022 forecast was finalised 22 days after the Russian invasion began and therefore represents our initial attempt to predict its economic consequences for the UK. The differences between this initial post-invasion forecast and outturn partly reflects what we, and everyone, subsequently learned about the duration and magnitude of the ensuing war; the severity of sanctions placed by the international community on Russia in response; how these and other factors influenced the paths of global energy, food, and other tradable goods prices and interest rates; their consequences for domestic inflation and economic activity; and the Government's policy response.
- 2.4 In evaluating the performance of these two economic forecasts for 2022-23, the chapter explores the differences between our forecast and the latest outturn data for:¹
- **market-derived assumptions**, including interest rates, gas and oil prices, equity prices, and the exchange rate;
 - the rate of **inflation** and its components, including the price of energy, other tradable and non-tradable items (Box 2.1);
 - the rate and composition of **real GDP growth**;
 - **household disposable income** and its components (Box 2.2);
 - **the labour market and productivity**; and
 - the rate and composition of **nominal GDP growth**, a key fiscal forecast determinant.

¹ The national accounts data used in this report are consistent with the ONS's release of the first quarterly estimate of GDP for the second quarter of 2023 published on 11 August 2023. At the time we sent this report to print on 28 September, the full set of revisions to national accounts data from the Blue Book 2023 were not due to be incorporated in official statistics until 29 September 2023, after this publication was finalised. We will consider its implications for the economy and public finances in our next forecast.

Market assumptions

2.5 Table 2.1 compares the market assumptions from our March 2021 and 2022 forecast with outturns for 2022-23:

- **Gas prices were 5 times higher in 2022-23 than we estimated in our March 2021 forecast**, as the Russian invasion of Ukraine in February 2022 drove prices to their highest level on record in the third quarter of 2022. Our March 2022 forecast reflects market expectations in the first quarter of 2022, when there were serious concerns about limited gas supplies and European storage capacity. A warmer-than-expected winter in Europe and surge in liquified natural gas imports from the US and Middle East eased concerns slightly, and our March 2022 forecast ended up overestimating gas prices by £0.60 per therm (19 per cent).
- **Oil prices were almost double our March 2021 forecast and remained slightly higher than expected in March 2022**. As oil is a globally traded commodity, European prices were less sensitive to the disruption in Russian supply than gas, which depends heavily on regional pipeline networks. Nonetheless, the impact of OPEC cuts to production and the EU ban on Russian oil in December 2022 pushed 2022-23 oil prices above expectations in both our March 2021 and 2022 forecasts.
- **Bank Rate averaged 2.3 per cent in 2022-23, exceeding our March 2021 and March 2022 forecast expectations by 2.3 and 0.9 percentage points respectively**. This came as the Bank of England responded to increased inflationary pressures, following the Russian invasion of Ukraine and growing supply constraints (as discussed in Box 2.1).
- **Gilt rates were 2.0 and 1.5 percentage points higher than expected in our March 2021 and 2022 forecasts**, reflecting rising global interest rates, higher-than-expected Bank Rate, and a spike in yields following the announcement of the 23 September growth plan – seemingly reflecting UK-specific factors that have since unwound.
- **Quantitative easing, reflecting the stock of assets held in the Asset Purchase Facility (APF) in 2022-23, was £56.9 billion less than we assumed in our March 2021 forecast**, which assumed the Bank reinvested remaining gilts rather than letting the APF run down. Our March 2022 forecast was also £19.8 billion above outturn, as it assumed only ‘passive’ runoff, rather than ‘actively’ selling gilts before they redeemed as has taken place since November 2022.
- **The effective exchange rate was broadly in line with our March 2021 forecast, but came in 4.3 per cent below our March 2022 forecast** despite a rising interest rate, reflecting the slowdown in the economy. The exchange rate also fell following the announcement of the 23 September Growth Plan, but like gilt prices, then recovered.

Table 2.1: Market-derived assumptions for 2022-23, financial year average

	Bank rate (per cent)	Market gilt rates (per cent)	Oil price (\$ per barrel)	Gas price (£ per therm)	Quantitative easing ¹ (£ billion)	Equity prices (FTSE All- share)	Exchange rate (index)
March 2021 forecast	0.05	1.19	51.7	0.4	874.9	4,150	79.5
March 2022 forecast	1.43	1.65	91.7	2.9	837.9	4,187	82.4
Latest data	2.31	3.18	95.2	2.4	818.1	4,089	78.9
Difference²							
March 2021	2.26	1.98	84.3	446.6	-56.9	-1.5	-0.8
March 2022	0.88	1.53	3.9	-19.4	-19.8	-2.3	-4.3

¹ Total asset purchases, including corporate bonds, at the end of the 2022-23 financial year.
² Per cent difference except Bank Rate and market gilt rates (percentage points) and quantitative easing (£ billion).

2.6 These large increases in gas prices, oil prices, and interest rates in the space of less than 12 months are unprecedented in the 13 years in which the OBR has been forecasting the economy. Prior to the £1.30 per therm year-on-year increase in gas prices from 2020-21 to 2021-22, and £0.70 per therm increase seen from 2021-22 to 2022-23, the largest year-on-year increase was the £0.20 increase seen in 2008-09. And before the 2.1 percentage point increase in Bank rate in 2022-23, the largest change in rates was the 0.6 percentage point cut in 2020-21. Many of the differences between forecasts and outturn for the economic variables discussed below are a consequence of those large global shocks.

Inflation

Inflation in 2022-23

2.7 The Russian invasion of Ukraine, coupled with a growing mismatch between the global demand for and supply of tradable goods, pushed the overall rate of CPI inflation 8.2 percentage points higher than in our March 2021 forecast in 2022-23. Rather than being just below the Bank of England's 2 per cent target as we forecast in March 2021, inflation averaged 10.0 per cent in 2022-23. As Table 2.2 shows, by the fourth quarter of 2022 inflation reached 10.7 per cent, its highest level in over 40 years. Our March 2022 forecast factored in pressure on energy prices from the Russian invasion of Ukraine, expecting inflation to peak at 8.7 per cent in the fourth quarter of 2022, but even this was 2 percentage points lower than what eventually transpired.

Table 2.2: Inflation forecasts

	Percentage change on a year earlier					2022-23 annual average
	2022			2023		
	Q2	Q3	Q4	Q1		
CPI inflation						
March 2021 forecast	1.8	1.9	1.9	1.9	1.9	1.9
March 2022 forecast	7.7	7.5	8.7	8.1	8.0	8.0
Latest data	9.2	10.0	10.7	10.2	10.0	10.0
Difference¹						
March 2021	7.3	8.1	8.8	8.3	8.2	8.2
March 2022	1.5	2.5	2.0	2.1	2.0	2.0

¹ Differences in percentage points. Totals may not sum due to rounding.

2.8 Our March 2021 forecast underestimated all of the underlying inflation components shown in Table 2.3. A faster-than-expected post-pandemic recovery in goods demand in North America and Europe bumped up against supply constraints in Asia, pushing up the prices of tradable goods. The Russian invasion of Ukraine and subsequent imposition of sanctions pushed up European energy prices with knock-on effects for the price of UK utilities (including electricity and gas prices) and food, beverages and tobacco. The prices of domestically produced services were also higher than anticipated due to a combination of higher energy and other input costs; pressures for higher wage increases to offset at least some of the increased cost of living; and a larger-than-anticipated reduction in the size of the labour force in the aftermath of the pandemic, which put further upward pressure on wages. While our March 2022 forecast included our initial estimate of the impact of the Russian invasion on domestic prices, we still underestimated the inflation contributions from energy by 0.2 percentage points, food, beverages, and tobacco by 1.2 percentage points, tradable goods by 1 percentage point, and slightly overestimated other non-tradables inflation by 0.4 percentage points.

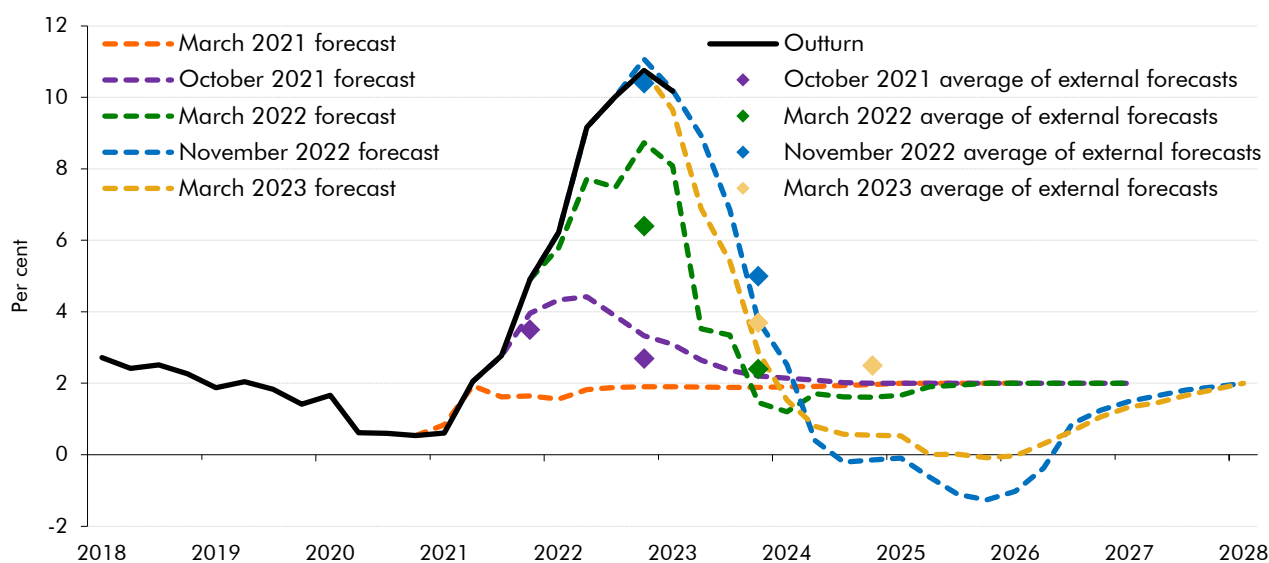
Table 2.3: Differences between outturn inflation contributions and our March 2021 and March 2022 inflation forecasts

	Percentage point contribution to annual CPI inflation					Total
	Food, beverages and tobacco	Utilities	Fuels	Other tradables	Other non-tradables	
March 2021 forecast	0.3	0.1	0.0	0.3	1.2	1.9
March 2022 forecast	0.7	3.3	0.4	1.3	2.4	8.0
Latest data	1.9	3.1	0.8	2.3	2.0	10.0
Difference¹						
March 2021	1.6	3.0	0.8	2.0	0.8	8.2
March 2022	1.2	-0.2	0.4	1.0	-0.4	2.0

¹ Differences in percentage points. Totals may not sum due to rounding.

2.9 As shown in Chart 2.1, inflation has proved to be not only higher but more persistent than we and other forecasters anticipated. Starting in our October 2021 forecast, we have forecast a period of significantly above-target CPI inflation. In our four forecasts between October 2021 and March 2023, we have forecast peak quarterly CPI inflation of 4.4, 8.7, 11.1, and 10.7 per cent respectively, and to stay above the 2 per cent target for the following four to nine quarters. While our forecasts for peak inflation were typically above the consensus at the time, they typically assumed inflation would be less persistent than other forecasters. Box 2.1 explores in more detail why outturn inflation has so-far proved to be higher and more persistent than expected in our recent forecasts.

Chart 2.1: Successive OBR inflation forecasts



Note: Average of independent forecasts newly submitted to HMT's *Forecasts for the UK economy* at the time of each *Economic and fiscal outlook* publication.

Source: HMT, ONS, OBR

Box 2.1: Why has recent inflation been stronger than we forecast?

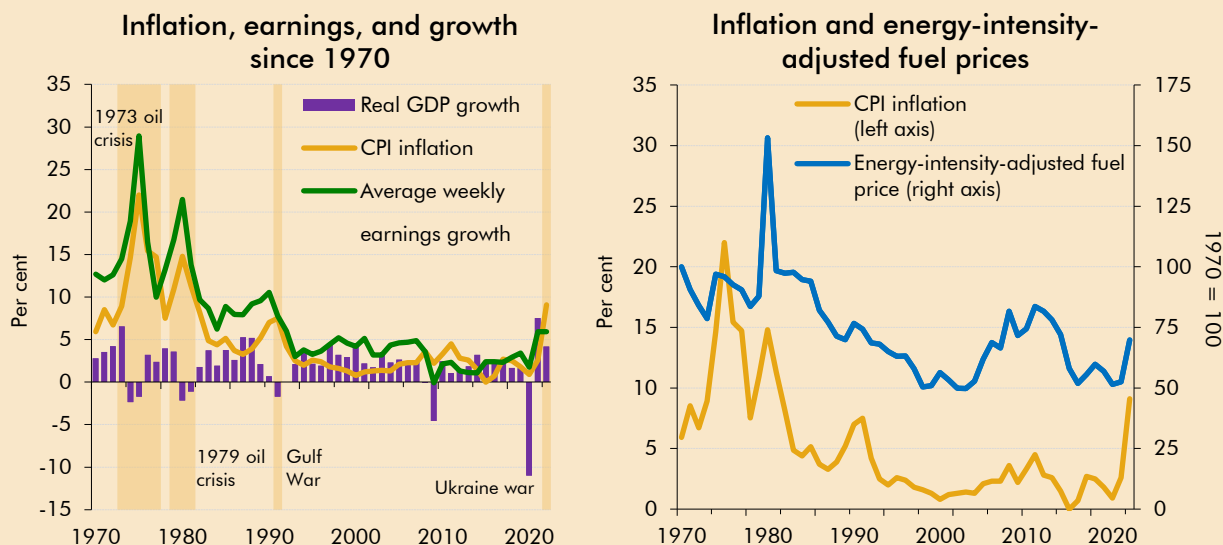
Over the past two years, inflation has turned out to be significantly higher than we and many other forecasters expected. This unexpected rise in inflation began in the second half of 2021 and was initially driven largely by post-pandemic strains in global supply chains that pushed up the price of tradable manufactured goods. Following the February 2022 Russian invasion of Ukraine, these pressures on goods prices were augmented by historic rises in energy and food prices (that were already increasing prior to the invasion). These externally-driven inflationary pressures have more recently been compounded by stronger domestically-generated inflation as the UK labour market has remained tight. Together, these factors pushed CPI inflation up to a peak of 11.1 per cent in October 2022, before declining to 6.7 per cent in August 2023 as external inflationary pressures receded.

The respective contributions of these external and domestic factors to stronger-than-expected inflation have also shifted over time. Our March 2021 inflation forecast was conditioned on gas prices that turned out to be five times higher than markets expected at the time we completed that forecast. But our March 2022 forecast was based on an assumption for energy prices that has turned out to be significantly closer to outturn. More of the explanation for our more recent underestimation of inflation can therefore be found in our assumptions for how the energy price shock propagated through to other prices in the rest of the economy.

Informed by the impact of previous energy price shocks on the UK economy, our post-Russian-invasion forecasts for inflation assumed that higher energy prices would have a substantial knock-on⁹ effect on wider prices in the economy. Previous spikes in global oil prices triggered by the 1973 Yom Kippur War and 1979 Iranian Revolution had significant and lasting effects on CPI inflation in the UK, as shown by the left-hand panel in Chart A. We discussed what lessons could be drawn from this period in Box 3.1 of our 2022 *Fiscal risks and sustainability report*.

That analysis concluded that, while the knock-on effects from higher energy prices onto other prices in the economy were likely to be significant, the decline in the overall energy intensity of the UK economy (right-hand panel in Chart A) as well as changes to the structure of the labour market and the operation of monetary policy were likely to have muted those effects over the past half-century.

Chart A: Energy-intensity-adjusted fuel price and inflation, earnings, and GDP growth since 1970



Source: Bank of England, ONS, OBR

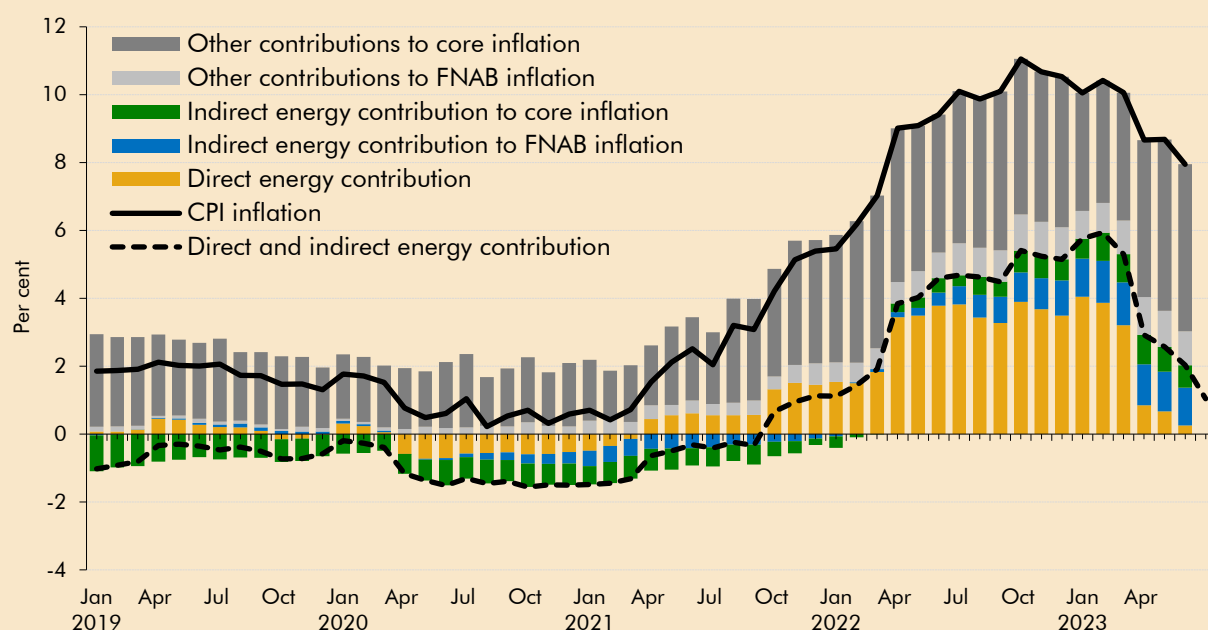
In our March 2022 forecast, we assumed that these knock-on effects would add a further 25 per cent to the direct effect of higher energy prices on inflation. This assumption was based on a range of studies that suggested that, in general, the pass-through of modest rises in oil prices to wider, non-energy inflation had declined to near-zero,^b but that larger energy price shocks still generated some wider pass-through to domestic prices.^c To arrive at the 25 per cent assumption we therefore began by halving the size of the upper end of a range suggested by this external historical analysis (the upper end of the range of effectively assumed full and immediate pass-through of energy into other prices). As this analysis also generally incorporated shocks from previous decades, including the 1970s period, and countries outside of the UK,^d we then further adjusted down the estimate based on our own analysis of the current weight of energy in production and consumption in the UK.

The subsequent evolution of CPI inflation suggests that our assumption for the size of these knock-on effects from higher energy prices has proved to be too low. Three factors are likely to form part of the explanation. First, there is growing evidence of strong non-linearities in the pass-through of energy shocks, with stronger pass-through when inflation is already high.^e In this case, soaring gas prices following the Russian invasion of Ukraine came on top of already rising prices of goods in the wake of the pandemic, compounding its inflationary effects. Second, the post-pandemic labour market has been tighter than expected which put labour in a stronger bargaining position in seeking to protect their real wages in the face of surging prices for energy, food, and other essentials. Finally, it is possible that increases in Bank Rate since 2022 have

taken longer than we expected to reign in growth in aggregate demand, despite adjustments made for the growth in the number of fixed rate mortgages since monetary policy was last tightened significantly in the period preceding the global financial crisis.

Our latest analysis supports the conclusion that elevated energy prices have had a larger overall impact on CPI inflation than we anticipated. To evaluate the size and timing of the knock-on effects of the 2022 energy shock, we decompose headline CPI inflation into: the direct energy contribution; the indirect contribution to core and to food and non-alcoholic beverages (FNAB) inflation; and other contributions to core and FNAB inflation (which will also include some of the wider knock-on effects from higher energy prices).^f Chart B shows that the direct contribution (dark yellow column) peaked at 4.0 percentage points in January 2023 and averaged 3.6 percentage points over the 12 months to March 2023. The indirect energy effects (blue and green columns) started to make a positive contribution around mid-2022, peaked at 2.1 percentage points in March 2023 and averaged 1.6 percentage points over the twelve months to June 2023. This suggests the additional indirect effects of energy on CPI inflation have therefore been just under half the size of the direct energy impact over this period, or almost twice as large as our initial estimate.

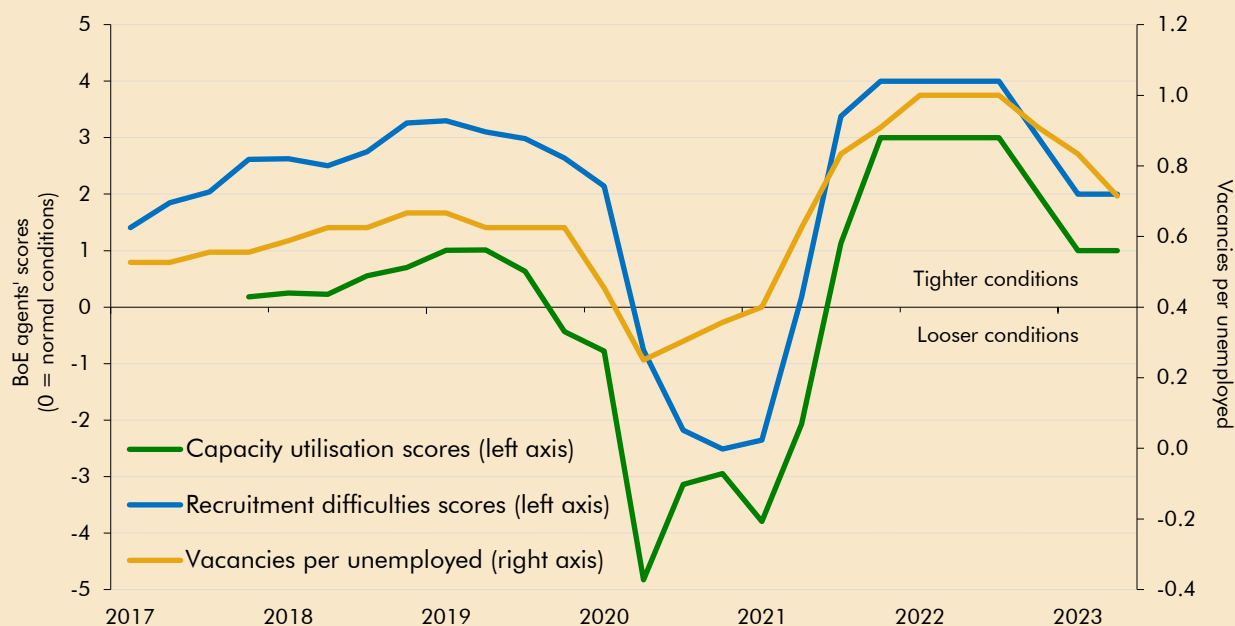
Chart B: Contributions to CPI inflation



Source: ONS, OBR

Some of the remaining unexpected strength of inflation is also likely to be explained by a greater degree of excess demand in the economy than we thought, resulting in greater domestically-generated inflation than anticipated. Survey measures of capacity utilisation and recruitment difficulties have been relatively high since the energy price shock (Chart C)^g. While they have fallen back more recently, they are still in positive territory, indicating ongoing tightness in product and labour markets. The number of vacancies relative to the unemployed population shows a similar pattern of labour market tightness; it soared to record-highs of 1 vacancy per unemployed in mid-2022 and has since only fallen to 0.7, still well above its historical average of 0.4.

Chart C: Indicators of capacity utilisation and labour market tightness



Source: Bank of England, ONS, OBR

In our upcoming Autumn 2023 forecast we will revisit this assessment of the inflationary impacts of the energy shock. We will also review the extent to which other macroeconomic factors such as tightness in labour and product markets; the evolution of the fiscal and monetary policy stances; inflation expectations; and lending and money supply growth might affect the evolution of inflation.

^a These effects include the indirect impact of raising the costs of producing other goods and services in proportion to the energy intensity of their production, as well as additional “second round” effects, including compensatory wage demands and the response of fiscal and monetary policy, as explained in Box 2.2 of our March 2022 EFO.

^b See Conflitti, C. and M. Luciani, Oil Price Pass-Through into Core Inflation, 2017; Millard, S., An estimated DSGE model of energy, costs and inflation in the UK, 2011; Choi, S., et al, Oil Prices and Inflation Dynamics: Evidence from Advanced and Developing Economies, 2017.

^c See Abdallah, C. and K. Kpodar, How Large and Persistent is the Response of Inflation to Changes in Retail Energy Prices?, June 2020.

^d See European Central Bank, Oil prices – their determinants and impact on euro area inflation and the macroeconomy, August 2010.

^e See De Santis, R. and Tornese, T. Energy supply shocks’ nonlinearities on output and prices, August 2023; Garzon, A. and Hierro, L., Asymmetries in the transmission of oil price shocks to inflation in the eurozone, December 2021.

^f We estimate a Vector Autoregressive Model (VAR) with monthly data from January 1989 to June 2023, and include energy inflation, food and non-alcoholic beverage inflation, core inflation (defined as all items excluding energy and food and non-alcoholic beverages) and control for the unemployment rate. We do not control for negotiated wage growth as average weekly earnings monthly data in the UK is only available from 2000. Our approach follows a similar methodology to Corsello, F. and Tagliabrischi, A. Assessing the pass-through of energy prices to inflation in the euro area, February 2023 and Pallara, K., et al, The impact of energy shocks on core inflation in the US and the euro area, August 2023. Following the former study, we do not directly control for inflation expectations or monetary policy, though this impact should appear on the ‘other’ non-energy contributions in Chart B.

^g The Bank of England Agents’ scores are judgement-based assessments, based on conversations with businesses. Scores for recruitment difficulties and capacity utilisation reflect conditions relative to normal (0 indicates normal conditions, and +5 or -5 extreme ones).

Real GDP

2.10 Real GDP growth in 2022-23 was overestimated in the March 2021 and March 2022 forecasts by 3.3 and 0.6 percentage points respectively, partly due to the supply shock

stemming from Russia's invasion of Ukraine. The associated rise in energy prices increased the price of a major input into the production of goods and services in the UK. This, alongside global supply bottlenecks, weighed on productivity in the UK economy. With the UK being a net importer of energy and the other goods that were affected by supply bottlenecks, the rise in the price of these products eroded real wages, which in turn dragged on consumption growth. Labour market participation has also been weaker than we expected in 2021 mainly due to a stronger and more persistent increase in those who report being long term sick. The overestimate of GDP growth in 2022-23 in the March 2021 forecast also reflects our underestimation of the level of GDP in 2021-22 as the economy rebounded more quickly from the pandemic.²

2.11 Table 2.4 breaks down the real GDP growth forecast differences for 2022-23 into the expenditure components of GDP:

- Weaker **consumption** explains 3.9 percentage points of the difference between the March 2021 forecast and outturn, consistent with higher-than-expected inflation and interest rates following the invasion. The March 2022 forecast also overestimated consumption although by a much smaller margin, explaining 0.2 percentage points of the GDP growth forecast miss.
- Weaker **business investment** contributed 0.6 percentage points to the difference between the March 2021 forecast and the outturn. Business investment growth was revised down in March 2022, and subsequently was broadly in line with outturn, partly reflecting a reduced assessment of the impact of the super-deduction on investment.
- **Net trade** was less of a drag on growth than expected across both the March 2021 and March 2022 forecasts, respectively contributing 1.0 and 1.5 percentage points more to GDP growth than forecast. This is partly due to stronger-than-expected export growth. However, changes in data collection mean UK trade data over recent years are even more prone to revision than usual.³ Adjusted trade figures published by the Bank of England, stripping out the impact of trade measurement issues, point to lower imports than indicated by the latest ONS outturns.⁴
- **Other components** contributed less to GDP growth than anticipated in the March 2021 and March 2022 forecasts, explaining 0.4 and 1.3 percentage points of the respective misses. This is partly owing to changes in inventories, as firms built up fewer stocks than expected, likely owing to supply disruptions. Other components of GDP are also highly volatile and subject to large revisions.

² As discussed above, the full set of revisions to GDP data from the Blue Book 2023 were not published until after this evaluation was completed, and so have not been incorporated in this analysis.

³ ONS, *Understanding the latest changes to UK trade figures with the EU*, March 2022.

⁴ Bank of England, *Monetary Policy Report*, February 2023.

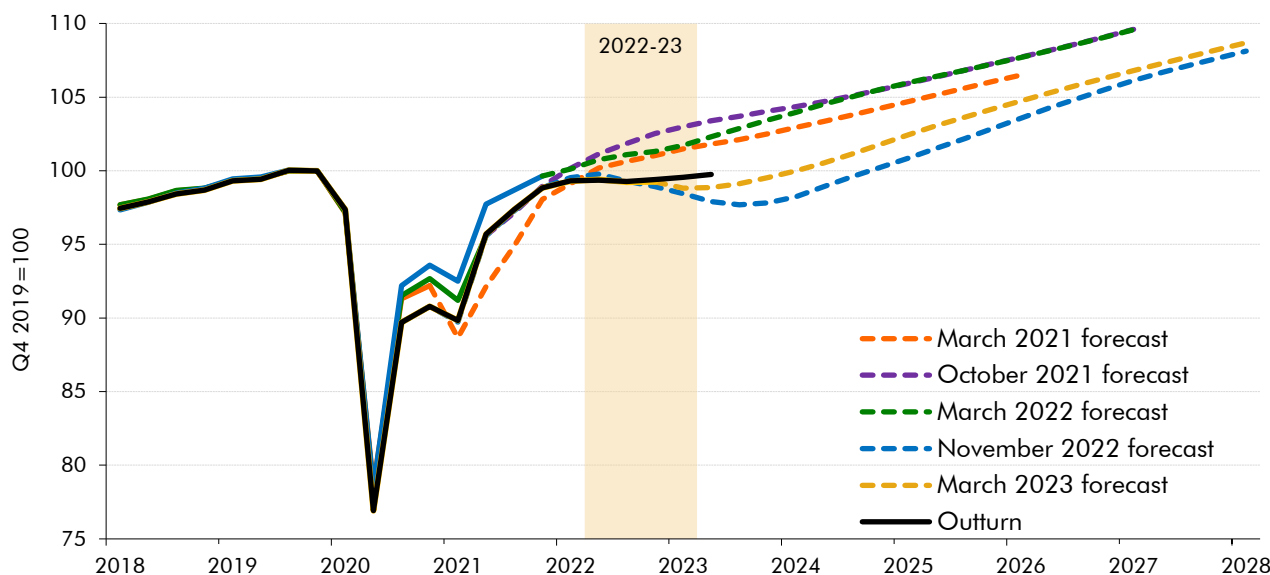
Table 2.4: Expenditure contributions to real GDP growth in 2022-23

	Percentage points							GDP
	Private consumption	Business investment	Private residential	Total government	Net trade	Other		
March 2021 forecast	5.2	1.4	0.2	0.1	-0.1	-1.8	5.0	
March 2022 forecast	1.5	0.9	0.1	0.3	-0.5	-0.1	2.2	
Latest data	1.3	0.8	0.3	-0.3	0.9	-1.4	1.6	
Difference¹								
March 2021	-3.9	-0.6	0.1	-0.3	1.0	0.4	-3.3	
March 2022	-0.2	-0.1	0.2	-0.6	1.5	-1.3	-0.6	

¹ Difference in unrounded numbers.

2.12 Chart 2.2 shows how these differences in growth rates affected the performance of our forecasts for the levels of real GDP in 2022-23 in our March 2021 and March 2022 forecasts. In both forecasts, more pessimistic growth trajectories meant our forecast undershot the latest outturn. But these comparisons are complicated by revisions to the historical level of GDP: since our March 2022 forecast, the level of GDP in the 2022-23 fiscal year has been heavily affected by an ONS downgrade to the extent of the recovery in GDP following its 2020-21 trough.⁵ It also highlights that in our most recent March 2023 forecast, the near-term economic downturn was forecast to be shorter and shallower than projected in November 2022, partly due to a lower interest rate path and a faster-than-anticipated fallback in European gas prices.

Chart 2.2: Successive forecasts for the level of real GDP



Note: Outturn is consistent with the first estimate of GDP for the second quarter of 2023, so does not take into account the revisions that (when this report went to print) were due to be incorporated in the 29 September Quarterly National Accounts.
Source: ONS, OBR

⁵ As discussed above, since that forecast, the ONS announced that further historical revisions to the level of GDP were to be expected in its September Quarterly National Accounts release. At the time we sent this report to print, these changes were expected to revise up GDP growth by 0.6 per cent in 2020 and by 1.1 per cent in 2021. See, ONS, *Impact of Blue Book 2023 changes on gross domestic product*, September 2023. This highlights that any conclusions drawn from current data are necessarily provisional and are likely to remain so for some years to come.

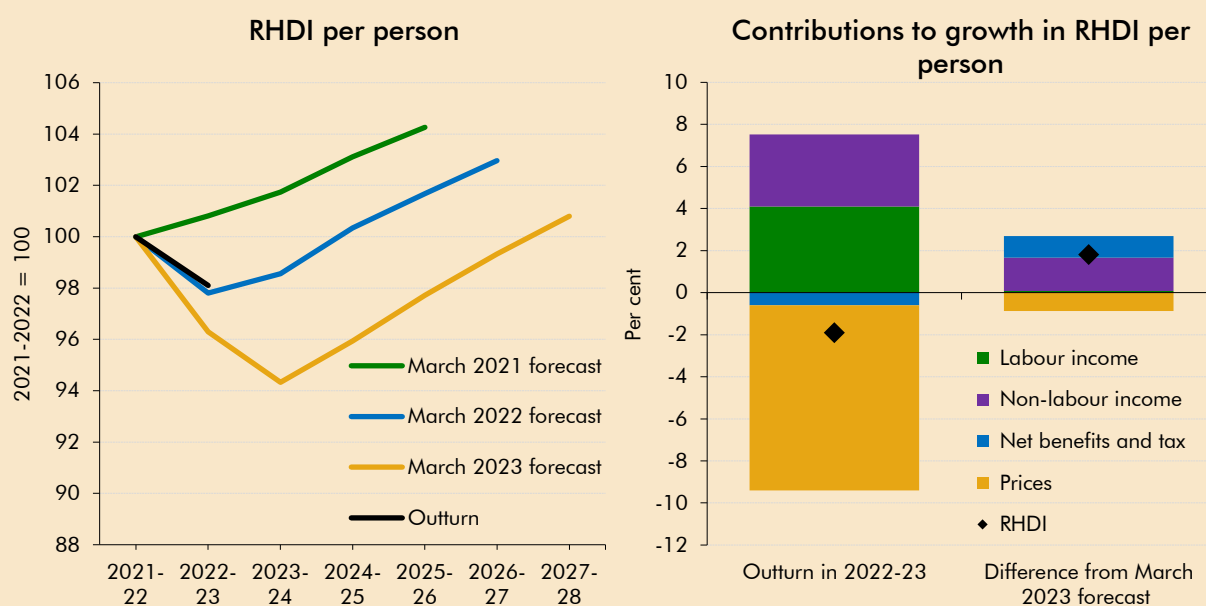
Box 2.2: Why has real household disposable income been stronger than forecast?

Following the invasion, we projected that in 2022-23 rising inflation would lead to the biggest fall in real household disposable income per person, a measure of living standards, in any single financial year since ONS records began in 1956-57. The March 2022 EFO forecast RHDH per person to fall by 2.2 per cent in 2022-23, and to return sustainably to its pre-pandemic level only in 2024-25. More recently, in March 2023 we expected this fall to be substantially larger at 3.7 per cent, followed by another fall in 2023-24 of 2.0 per cent.

ONS outturn estimates from June 2023 suggest that RHDH per capita fell by 1.9 per cent in 2022-23, still constituting the largest single-year fall on ONS records, but 1.8 percentage points less than we forecast in March 2023 (although broadly in line with the March 2022 forecast). It is possible that future data releases lead to further revisions, given measurement challenges and uncertainties around 2022-23 incomes data.

The difference in outturns relative to the March 2023 forecast is largely explained by net benefits and taxes having supported RHDH more than expected, and non-labour income turning out stronger than forecast. Specifically, net benefits and taxes contributed 1.0 percentage points more to growth in RHDH 2022-23 relative to the previous financial year (subtracting 0.6, rather than 1.6 percentage points). Non-labour income growth added 1.6 percentage points more than forecast in March 2023 (adding 3.4 percentage points altogether). Growth in labour incomes were broadly in line with outturns, only contributing 0.1 percentage points more than previously expected (4.1 percentage points in total). Stronger than expected inflation dragged on RHDH growth by 0.9 percentage points more than we forecast in March (taking 8.8 percentage points off growth).

Chart D: RHDH per person



Source: ONS, OBR

The strength in net benefits and taxes is largely explained by lower-than-expected June Quarterly National Account (QNA) outturns in household taxes on income and wealth as well as employee social contributions. Public sector finances data on receipts suggests higher outturns for taxes and contributions, so there is a possibility the ONS revises 2022-23 figures in its upcoming September QNA release.

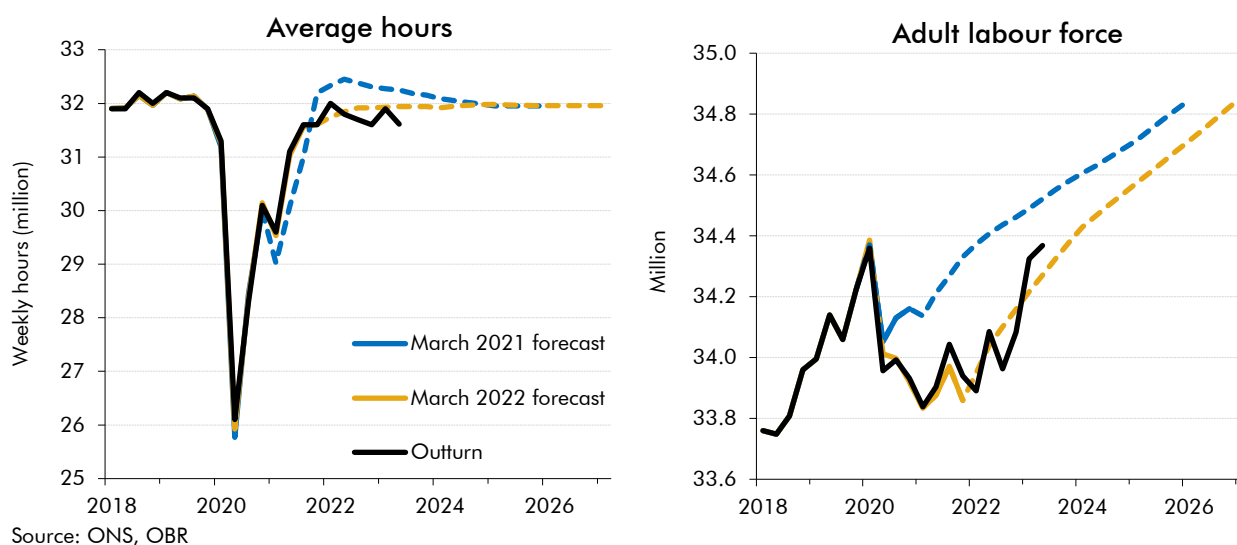
Within non-labour incomes, higher interest rates have provided a bigger boost to RHDl in 2022 23 than we expected in March 2023, though over time we expect there to be little impact from interest rates on aggregate RHDl. As market interest rates increase, mortgage and other interest payments rise, but higher interest rates also lift interest income on household savings. Given the stock of overall household deposits is roughly equal to the stock of debt, the impacts of these changes broadly offset in aggregate, although timings can differ. In 2022-23, the effect from interest income dominated as rising deposit rates affected all households with interest-bearing savings, while the rise in the number of fixed mortgage contracts meant that only a fraction of those with mortgage debt moved to higher rates in that year. Overall household investment income was £8.9 billion more than our March 2023 forecast expected (0.5 per cent of household disposable income), while overall interest payments were £0.6 billion higher.

As consumption came in closer to our March 2023 forecast, underestimating RHDl relative to the June data release led us to underestimate household savings. All else equal, stronger-than-expected household incomes enable households to consume more, which provides support to wider economic activity. But it can also lead to higher household savings. While outturns for consumption in 2022-23 have been broadly in line with our March 2023 forecast, the household saving ratio (excluding net pension adjustments) has turned out to be 1.5 percentage points higher than we expected.

Labour market and productivity

- 2.13** Labour supply growth in 2022-23, measured in terms of total hours worked, was 2.2 and 0.6 percentage points less than estimated in both the March 2021 and March 2022 forecasts respectively. This undershoot mainly reflects a significant overestimation of average hours worked, which did not recover to pre-pandemic levels as swiftly as had been expected following the closure of the furlough scheme (as shown in the left panel of Chart 2.3). The larger rise in part-time employment of around 340,000 over the year to the first quarter of 2023, compared with only 20,000 in full-time employment, may have weighed on overall average hours worked.
- 2.14** The labour force, which had undershot expectations significantly during 2021-22, began to recover at a pace more in line with our forecasts over 2022-23 (as shown in the right panel of Chart 2.3). This was led by a recovery in activity rates, especially among students and those with caring responsibilities, potentially motivated by the sharp rise in the cost of living. This more than offset a continued rise in those unable to work due to long term sickness, which reached record levels of more than 2.5 million by September 2022. So, while the level of the labour force was lower than had been expected in the March 2021 forecast, the error in the 2022-23 growth rate was only 0.1 percentage points below the outturn. The March 2022 forecast error was 0.1 percentage points above the outturn.

Chart 2.3: Average hours and adult labour force



Source: ONS, OBR

- 2.15** Labour market conditions proved tighter than expected as the closure of the furlough scheme did not result in a rise in the unemployment rate over the second half of 2021-22 as expected in the March 2021 forecasts. Also, the robust recovery in employment over 2022-23 overshot expectations, with the number of vacancies reaching record levels both in absolute terms, relative to new hires, and to those either unemployed or inactive. The outturn for annual employment growth in 2022-23 was 0.3 and 0.1 percentage points higher than expected in the March 2021 and March 2022 forecasts. This resulted in the unemployment rate falling faster than expected, undershooting both the March 2021 and March 2022 forecasts by 2.0 and 0.3 percentage points respectively.
- 2.16** The assessment of our forecast performance relative to outturn has been complicated by measurement issues with the ONS' Labour Force Survey (LFS) which is the main source of our estimates. Comparisons to other datasets such as the HMRC's PAYE based employees and the ONS' Workforce Jobs Survey suggest the LFS may be underestimating employment, as while it shows a rise in employment of 360,000 in the year to the first quarter of 2023, the Workforce Jobs Survey indicates the rise is closer to 1 million. The HMRC dataset, which only covers employees, shows a rise of close to half a million. Some of the difference may be explained by differences in content, coverage and methodology between the datasets.⁶
- 2.17** Nominal average earnings growth was stronger than expected by our March 2021 and March 2022 forecasts, by 3.3 and 0.7 percentage points respectively. The difference was due to labour market conditions proving much tighter than anticipated, alongside markedly higher inflation. As mentioned above, a rapid pick-up in labour demand led to a tightening in labour markets. This was initially driven by private sector pay growth, which rose strongly as employers increasingly struggled with recruitment and retention against a backdrop of strong churn, record vacancies and rising inflation. More recently, public sector earnings growth has caught up, boosted by one-off lump sum payments from backdated pay increases and bonus payments. Strike action has also contributed to the upward pressure.

⁶ More information on the differences between the two surveys is available from ONS, *Reconciliation of estimates of jobs, UK*, October 2022, which compares Workforce Jobs estimates with the equivalent estimates from the LFS.

2.18 Productivity growth was 1.2 percentage points weaker than expected in the March 2021 forecast, which overestimated GDP growth by 3.3 percentage points in 2022-23 but total hours growth by only 2.2 percentage points. Both were revised lower in the March 2022 forecast, which predicted no growth in productivity, and ended up much closer to the 0.1 per cent outturn. The weakness in productivity growth over the year suggests that the post-pandemic rebound in total factor productivity may not have been as strong as expected.

Table 2.5: Labour market in 2022-23

	Total hours (million)	Average hours (hours)	Total employment (thousand)	Labour force (thousand)	Unemployment rate	Average earnings	Productivity per hour
Per cent change							
March 2021 forecast	3.7	3.0	0.6	0.4	-0.2	2.5	1.3
March 2022 forecast	2.2	1.3	0.8	0.6	-0.2	5.1	0.0
Latest data	1.5	0.6	1.0	0.5	-0.4	5.8	0.1
Difference¹							
March 2021	-2.2	-2.5	0.3	0.1	-0.2	3.3	-1.2
March 2022	-0.6	-0.8	0.1	-0.1	-0.2	0.7	0.0
Levels change							
March 2021 forecast	38	1	208	153	-55		
March 2022 forecast	22	0	266	215	-51		
Latest data	16	0	311	170	-142		
Difference¹							
March 2021	-22	-1	103	17	-87		
March 2022	-6	0	45	-46	-91		

¹ Difference in unrounded numbers.

Nominal GDP

2.19 Our economy forecast provides the basis for the fiscal forecasts that we use to assess the Government's performance against its fiscal targets. The most fiscally important elements of the economy forecast are those that drive the major tax bases, namely the income and expenditure components of nominal rather than real GDP. These are influenced by both real GDP and whole economy inflation, as well as by changes in the share of whole economy nominal GDP accounted for by each component. As a result, the fiscal forecast differences discussed in Chapter 3 tend to be influenced heavily by surprises in the composition of nominal GDP as well as its overall size. These influences were important to consider in 2022-23: a year in which unexpectedly high inflation lifted certain expenditure components of GDP, as well as nominal earnings. In this section, we briefly review the key nominal forecasts that underpin the analysis of fiscal forecast differences in 2022-23 that is presented in Chapter 3.

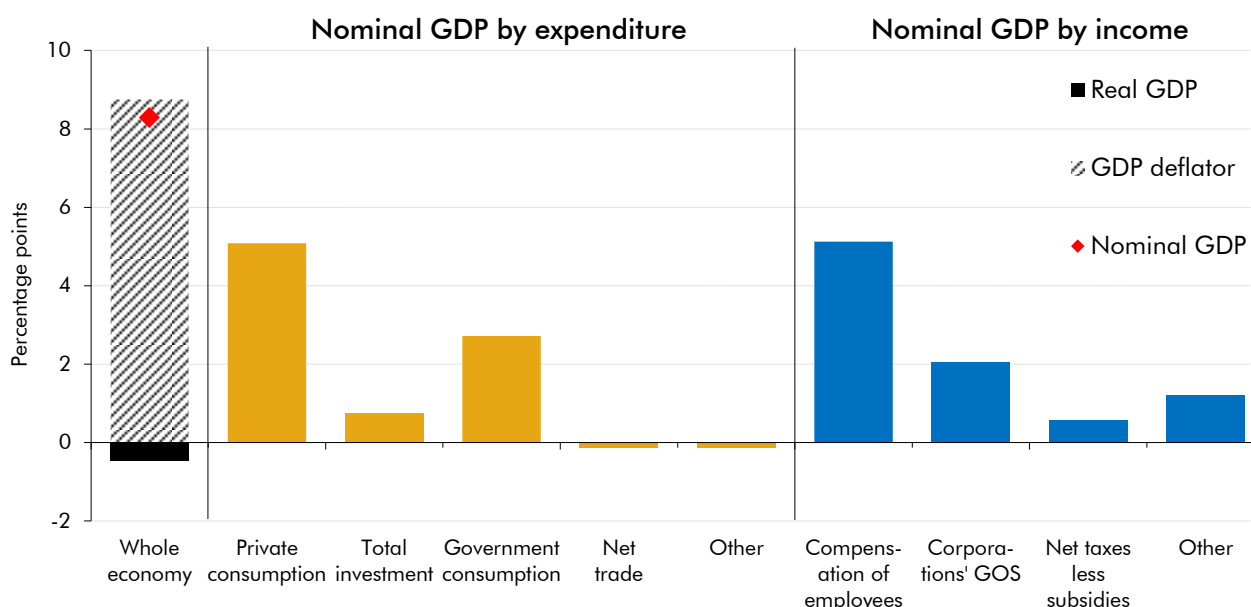
March 2021 forecast

2.20 Stronger-than-expected growth in the GDP deflator meant our March 2021 forecast underestimated cumulative growth in nominal GDP from 2020-21 to 2022-23, despite

cumulative real GDP growth turning out weaker than expected.⁷ The GDP deflator was forecast to decline by 2 per cent over this period, but the unexpected rise in energy prices and the costs of supply chain disruptions led to 6.8 per cent growth. As a result, nominal GDP increased by 21.3 per cent over 2020-21 to 2022-23, 8.3 percentage points more than we forecast, though real GDP growth was weaker by 0.5 percentage points. On the expenditure side, this is reflected in nominal consumption contributing 5.1 per cent more to nominal GDP than forecast in March 2021. The growth contributions of nominal investment and government consumption were 0.8 percentage points and 2.7 percentage points higher than expected, while net trade made a contribution in line with our expectations at the time.

2.21 On the income side, there was a large upward surprise in the contribution of employees' compensation, adding 5.1 percentage points more to cumulative nominal GDP growth between 2020-21 and 2022-23 than forecast. The gross operating surplus (GOS) of corporations also grew more strongly than expected, partly due to additional profits made by energy companies and the impact of energy support policies on the rest of the corporate sector, adding an additional 2 percentage points to nominal GDP growth. Given large alignment adjustments in recent data releases, there is still some uncertainty about 2022-23 outturns.

Chart 2.4: March 2021 forecast differences in contributions to cumulative nominal GDP growth between 2020-21 and 2022-23



Note: Corporations' GOS stands for private corporations' gross operating surplus.
Source: ONS, OBR

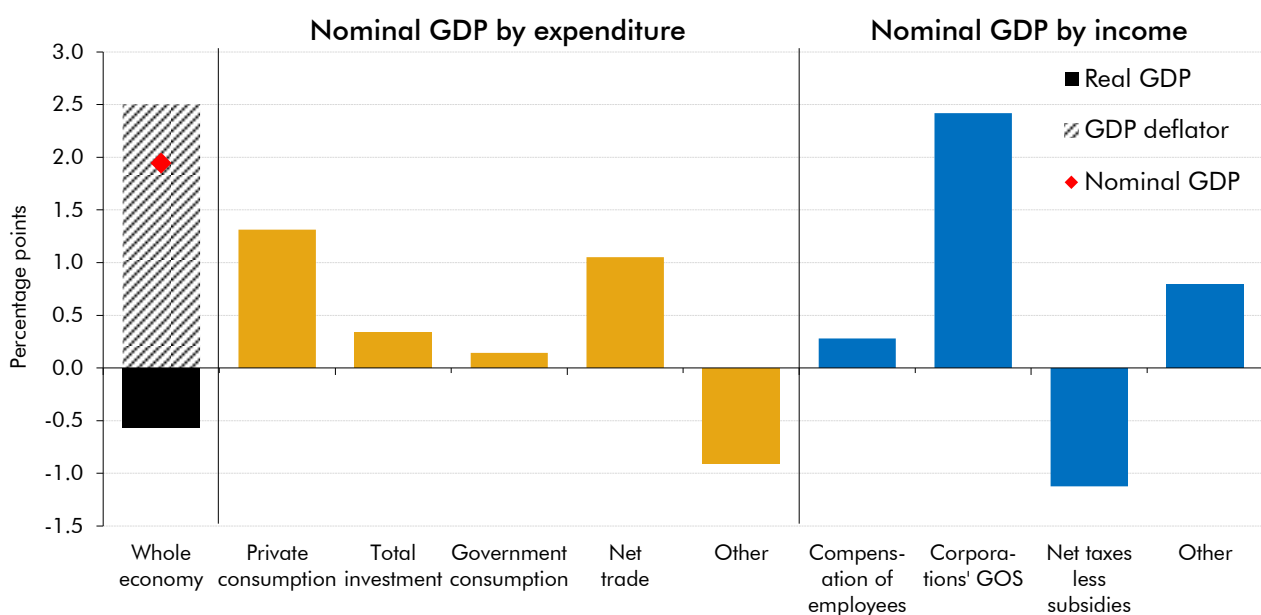
⁷ Because two years' worth of forecast differences occurred between our March 2021 nominal GDP growth forecast and outturn for 2022-23, we consider the difference in cumulative growth over those two years in this section (as this is what matters most for the eventual difference in the levels of nominal GDP and receipts between our March 2021 forecast and outturn).

March 2022 forecast

2.22 **Faster-than-expected whole economy inflation meant our March 2022 forecast for nominal GDP growth in 2022-23 was also lower than what eventually happened.**⁸ While real GDP again grew by less than expected (by 0.6 percentage points), nominal GDP growth exceeded expectations by 1.9 percentage points. On the expenditure side, this was again spread across surprises to nominal consumption, investment, government consumption and net trade, which added 1.3 percentage points, 0.3 percentage points, 0.1 percentage points and 1.1 percentage points more to nominal GDP growth, respectively. Driven by real factors, other components provided a drag on nominal GDP growth, lowering nominal GDP by 1 per cent in 2022-23, rather than by 0.1 per cent that was expected in March 2022 (although as noted above these elements are highly volatile and subject to large revisions).

2.23 On the income side, our March 2022 forecast only slightly underpredicted the growth contribution of employees' compensation, as slightly weaker-than-expected hours growth was offset by slightly stronger-than-expected growth in average earnings. The contribution of corporations' GOS was more significantly underestimated by 2.4 percentage points in our March 2022 forecast. This was partly offset by a 1.1 percentage point smaller-than-expected contribution of net taxes less subsidies. These differences reflect uncertainty about the impact of energy support schemes and adjustments made by the ONS to align the different measures of GDP. As a result, it is possible that outturns for 2022-23 will be revised in future data releases.

Chart 2.5: March 2022 forecast differences in contributions to cumulative nominal GDP growth in 2022-23



Note: Corporations' GOS stands for private corporations' gross operating surplus.
Source: ONS, OBR

⁸ As only one year occurred between our March 2022 forecast and the end of 2022-23, a single financial years' forecast difference (rather than cumulative growth over two years) is the most useful metric for assessing how our fiscal forecast performed.

3 The public finances

Introduction

3.1 This chapter assesses the performance of our March 2021 fiscal forecast and our March 2022 fiscal forecast for the 2022-23 financial year. In each case we explore the differences between our forecast and the latest outturn data for:

- **public sector net borrowing (PSNB)**, beginning with a summary of how our estimates of PSNB in 2022-23 evolved over successive forecasts, and how these compared to estimates produced by other forecasters;
- the **receipts** and **spending** forecasts that underpin our March 2021 and March 2022 PSNB forecasts for 2022-23; and
- our March 2021 and March 2022 **public sector net debt (PSND)** forecasts for 2022-23.

3.2 Differences between outturn data and our forecasts have been broken down into:

- **policy changes** – differences due to policies announced after the publication of the forecast;
- **economic factors** – differences due to the changes in underlying economic conditions relative to our initial forecast;
- **classification changes** – differences due to items being reclassified into or out of the public sector following the forecast; and
- **fiscal forecasting differences** – any remaining differences that cannot be explained by the other categories, such as those related to how well the underlying forecast model matches reality or judgements that we impose on top of the effects of economic determinants.

The evolution of our borrowing forecast for 2022-23

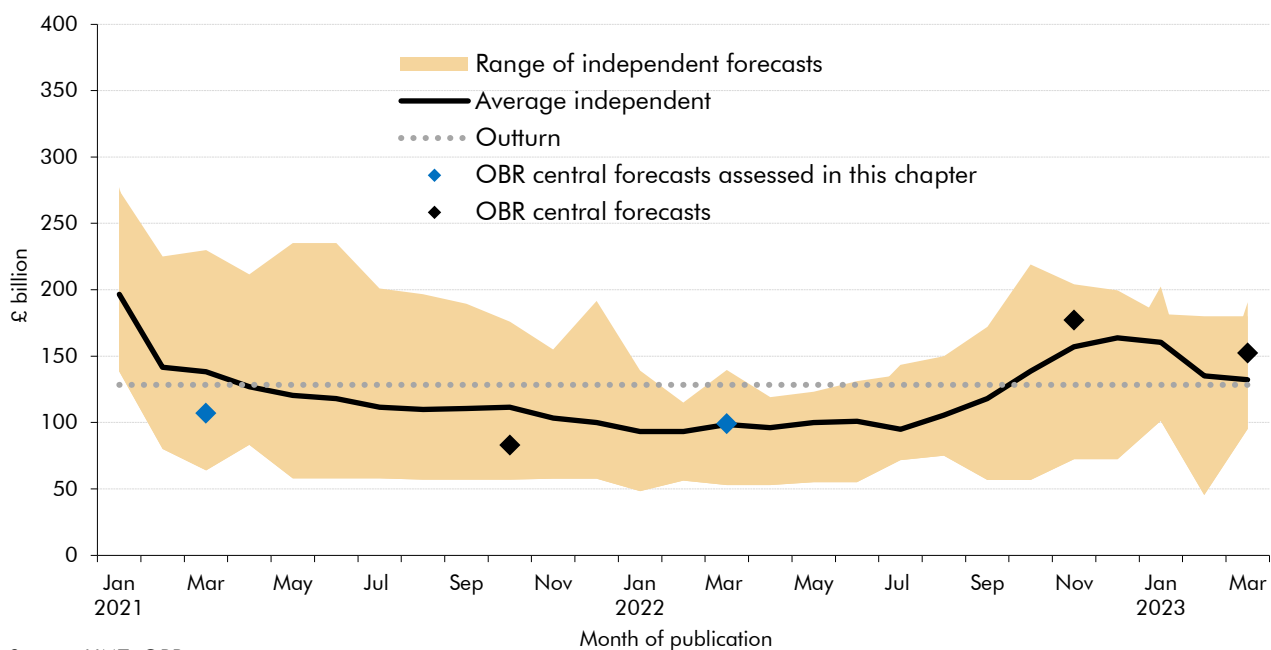
3.3 PSNB rose by 4.5 per cent in cash terms from £122.9 billion (5.3 per cent of GDP) in 2021-22 to £128.4 billion (5.1 per cent of GDP) in 2022-23. Outturn PSNB overshot our March 2021 forecast by £21.5 billion (0.8 per cent of GDP), our October 2021 forecast by £45.4 billion (1.8 per cent of GDP), and our March 2022 forecast by £29.3 billion (1.2 per cent of GDP).

The public finances

3.4 However, our November 2022 forecast of £177 billion (7.1 per cent of GDP), produced in the wake of the Ukraine war, the ensuing energy crisis, rising global interest rates, and policy measures announced over the Autumn, ended up overestimating outturn by £48.6 billion (1.9 per cent of GDP). This was due in large part to the ensuing fall in energy prices and interest rates which reduced expenditure on energy support schemes and debt interest respectively. Our most recent estimate of borrowing in March 2023 was £152.4 billion (6.1 per cent of GDP) – which was £23.9 billion (0.9 per cent of GDP) above outturn. Lower borrowing mainly reflects lower central government spending and differences in estimates for funded pensions.

3.5 Chart 3.1 below shows how each of these forecasts compared to outturn as well as the average and range of independent forecasts published contemporaneously. Our forecasts in March 2021 and October 2021 were relatively more optimistic than the average forecast, while our March 2022 forecast was in line with the average. During the summer of 2022, borrowing forecasts became more pessimistic reflecting the unfolding economic landscape – the steep rise in energy costs, rising inflation, and the fallout from the mini-Budget - with OBR’s November 2022 and March 2023 more pessimistic than average. The remainder of this chapter focuses on the performance of our March 2021 and March 2022 forecasts and the reasons they differed from outturn.

Chart 3.1: Range of forecasts for 2022-23 PSNB



Source: HMT, OBR

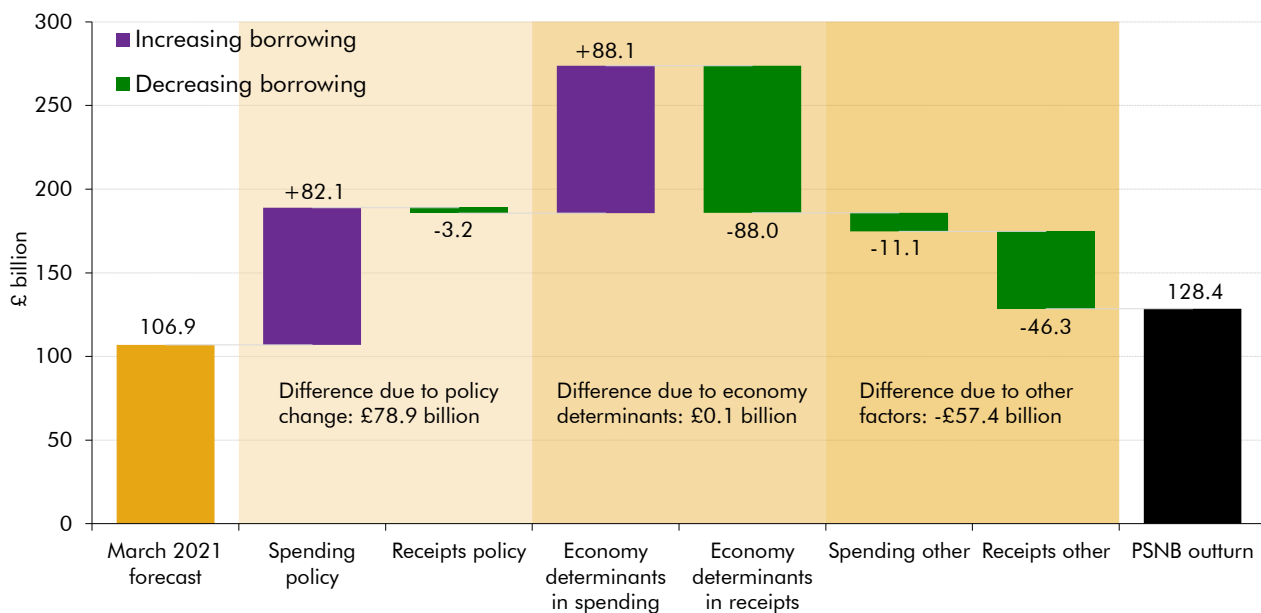
3.6 A breakdown of these PSNB forecast differences into spending and receipts are presented in Table 3.1. Against both the March 2021 and March 2022 forecasts, higher-than-expected receipts were more than offset by higher-than-expected spending, resulting in higher borrowing by end of the financial year.

3.7 Against our **March 2021 forecast**, borrowing came in £21.5 billion higher than expected. Of this overall difference:

- **Economic factors** are neutral due to very large differences on receipts and spending almost exactly offsetting: £88.0 billion in higher tax receipts offset by higher spending of £88.1 billion. Both effects are in large part due to higher-than-anticipated inflation:
 - (a) higher inflation and interest rates led to an additional £87.0 billion in inflation-linked and nominal debt interest. Welfare spending was only £1.8 billion higher than expected, as the positive effect of higher inflation and earnings on uprating (£4.8 billion) was offset by the effect of lower unemployment on universal credit spending (£3.7 billion).
 - (b) higher inflation also increased the key nominal tax bases. In the two years following the March 2021 forecast, wages and salaries rose at more than double the rate anticipated, consumption grew by 6.3 percentage points faster than forecast, and profits by 3.2 percentage points faster than forecast, contributing along with other economic factors to £88.0 billion higher receipts than forecast.
- **Policy changes** drove up borrowing by £78.9 billion due primarily to the Energy Price Guarantee and other support provided to help households and businesses to cope with the sudden rise in the cost of energy following the Russian invasion of Ukraine. See Box 3.1 for full details of the costs of these policies.
- **Other factors** reduced borrowing, partially offsetting the previously described differences by £57.4 billion: a £46.3 billion underestimate of receipts, and a £11.1 billion overestimate in spending.¹ Of the £46.3 billion overshoot in receipts unexplained by policy or economic determinants, around 37 per cent (£17.2 billion) was onshore corporation tax where the effective tax rate was higher than anticipated, and around 27 per cent (£12.3 billion) was income tax and National insurance contributions (NICs).

¹Classification changes of £1.4 billion are included in this category: our inclusion of capacity markets in environmental levies (£0.7) billion, which has not yet been included in ONS figures, and £0.7 billion from the treatment of corporate bond receipts in the APF.

Chart 3.2: March 2021 PSNB error for 2022-23 by source



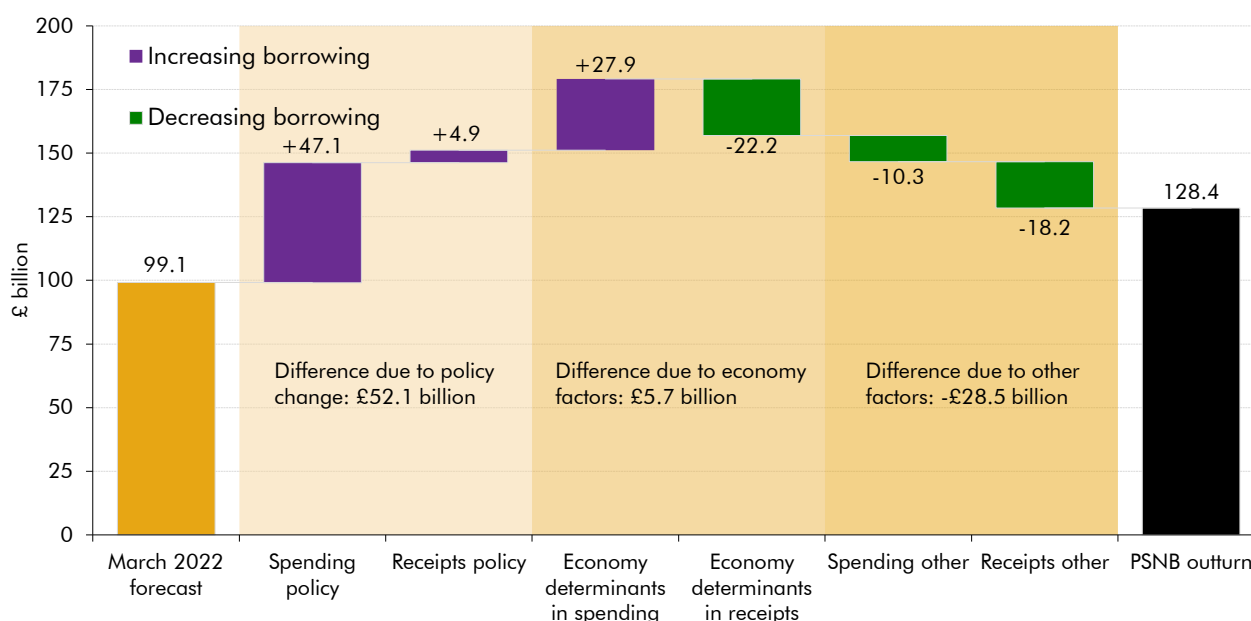
Note: 'Spending other' and 'Receipts other' includes differences due to classification changes.
Source: ONS, OBR

3.8 Our **March 2022 forecast** also underestimated borrowing by £29.3 billion. Of this overall difference:

- Forecast differences due to **economic assumptions** make up £5.7 billion of the overall PSNB error. £27.9 billion of the difference was due to higher spending – mainly from the underestimate of the inflation uplift acting on index-linked government debt and Bank rate on payments made from the Asset Purchase Facility (APF). This was partly offset by £22.2 billion of underestimated receipts from faster growth in tax bases and lower welfare spending (£0.6 billion).
- **Policy changes** make up £52.1 billion of total PSNB error. £47.1 billion (90 per cent) was due to new spending policies – particularly on energy support schemes (see Box 3.1) and cost-of-living payments (£8.4 billion). £4.9 billion was due in part to the cancellation of NICs rate rise after 7 months.
- **Other factors** reduced borrowing by £28.5 billion: £10.3 billion lower spending than anticipated and £18.2 billion higher receipts.² The unexplained receipts overshoot was mostly in onshore corporation tax where the effective tax rate has been much stronger than anticipated in March 2022's forecast.

² This includes a £0.7 billion classification change: we included capacity markets in environmental levies (£0.7) billion, which has not yet been included in ONS figures.

Chart 3.3: March 2022 PSNB error for 2022-23 by source



Note: 'Spending other' and 'Receipts other' includes differences due to classification changes.

Source: ONS, OBR

Table 3.1: 2022-23 receipts, spending and net borrowing forecasts

	£ billion						
	Forecast	Outturn	Difference	Classification changes	Policy changes	Economic factors	Fiscal forecasting difference
Borrowing (PSNB)							
March 2021	106.9	128.4	21.5	0.0	78.9	0.1	-57.4
March 2022	99.1	128.4	29.3	0.0	52.1	5.7	-28.5
Receipts (PSCR)							
March 2021	885.4	1,023	137.5	1.4	3.2	88.0	44.9
March 2022	987.5	1,023	35.5	0.7	-4.9	22.2	17.5
Spending (TME)							
March 2021	992.3	1,151	159.1	1.4	82.1	88.1	-12.5
March 2022	1,087	1,151	64.8	0.7	47.1	27.9	-11.0

Note: In spending economic factors, we have included debt interest and a ready-reckoned estimate of the impact of changes in economic determinants on welfare spending.

Receipts

3.9 Receipts increased as a share of GDP rise from 39.4 per cent in 2021-22 to 40.4 per cent in 2022-23. Receipts were stronger than anticipated in both the March 2021 EFO (by £137.5 billion) and the March 2022 EFO (by £35.5 billion). Key drivers include:

- **Economic determinants** which make up £88.0 billion (64 per cent) of the March 2021 forecast difference and £22.2 billion (63 per cent) of the March 2022 forecast difference. This was driven by higher wages and salaries, profits, and nominal

consumer spending than anticipated in either forecast. The March 2021 EFO forecast for earnings growth over 2021-22 and 2022-23 was 5 per cent compared to outturn of 13.0 per cent. Non-oil, non-financial profits were stronger than assumed in both the March 2021 and March 2022 forecasts despite higher wage and energy costs.

- **Policy changes** make up £3.2 billion (2 per cent) of the March 2021 forecast difference, and lowered receipts by £4.9 billion relative to the March 2022 forecast. Policies brought in since the March 2021 EFO include the usual fuel duty freeze £1.5 billion and the temporary 5p reduction in main rates of petrol and diesel £2.4 billion, business rates changes, the 1¼ percentage points rise in dividend taxation, and the rise in the primary NICs threshold from July 2022. After the March 2022 EFO, the energy profits levy was introduced in May 2022, and the temporary 1¼ percentage points rise in employee, self-employed and employer NICs was cancelled in the September 2022 mini-budget.
- **Fiscal forecast difference** makes up £46.3 billion (34 per cent) of the March 2021 forecast difference and £18.2 billion (51 per cent) of the March 2022 forecast difference. Companies in relatively tax-rich sectors continued to do well in 2022-23, and large companies saw higher profits than expected. There was a sharp rise in net interest margins boosting financial sector corporation tax; and greater than expected dividend income forestalling to avoid the 1¼ percentage point rise in dividend income tax which came into effect in April 2022.

Income tax and NICs

- 3.10 PAYE IT** in 2022-23 grew 10 per cent on 2021-22 figures to £212.0 billion, overshooting our March 2021 forecast by £30.3 billion (17 per cent) and our March 2022 forecast by £3.1 billion (1 per cent).
- 3.11 Self-assessed income tax (SA IT)** grew by 16 per cent on 2021-22 figures, reaching £42.9 billion in 2022-23; overshooting March 2021 estimates by £12.6 billion (42 per cent) and March 2022 estimates by £3.4 billion (9 per cent).
- 3.12 National insurance contributions (NICs)** exceeded our March 2021 forecast by £24.3 billion (16 per cent) but undershot our March 2022 forecast by £2.1 billion (around 1 per cent).
- 3.13** The drivers of difference in each of these personal tax receipts forecasts are broadly similar:
- **Economic determinant** differences (primarily higher wages and salaries) made up £47.3 billion (72 per cent) of the March 2021 forecast difference and £7.2 billion of the March 2022 forecast difference. For PAYE, higher average wages and, to a lesser extent, higher numbers of employees than anticipated drove the overshoots. For self-assessed income tax, March 2021's difference was driven by higher self-employment income, while for March 2022, it was higher dividend income than forecast - in large part likely due to forestalling ahead of the 1¼ percentage points rise in dividend tax rates from April 2022. It remains difficult to estimate the self-assessment tax base

using existing data: tax returns data for 2021-22 liabilities shows faster growth rates in self-employment income and self-employed numbers than captured in the Labour Force Survey (LFS) and National Accounts.³

- **Policy changes** due to the increase in NICs and dividend tax rates following March 2021's forecast, and a reversal of parts of these policies following March 2022's forecast. For the March 2021 forecast, £6.1 billion (9 per cent) of the error can be explained by policy changes including the temporary rise in NICs from April 2022, alongside the 1¼ percentage points rise in dividend tax rates. These were tempered by the increase in the NICs primary threshold from July 2022. Policy changes after March 2022 lowered receipts by £6.4 billion mainly due to the cancellation of the NICs rate rise from November 2022 which lowered receipts by £7.1 billion.
- The remaining **fiscal forecasting** residual captures differences in modelling as well as in-year receipts estimates. For March 2021's forecast, the residual fiscal forecasting difference made up £12.3 billion of the total error. For March 2022, fiscal forecasting differences were £1.8 billion. In both cases these differences are largely due to in-year receipts estimates being set too low.

VAT

3.14 VAT receipts in 2022-23 grew by £18.8 billion (13.1 per cent) to £162.1 billion. This exceeded our March 2021 forecast by £16.5 billion (11.3 per cent) and our March 2022 forecast by £7.9 billion (5.1 per cent).

- Of the £16.5 billion overshoot against the March 2021 forecast, economic factors account for £13.7 billion, mainly due to higher inflation resulting in stronger nominal consumer spending (£7.0 billion) and higher central government procurement (£4.0 billion). The fiscal forecast error of £2.0 billion reflected higher deductions offset by higher spending on standard rated goods and other fiscal modelling factors. The remaining £0.8 billion is due to subsequent policy announcements increasing VAT receipts.
- Of the £7.9 billion overshoot against the March 2022 forecast, economic factors account for £6.3 billion driven by higher housing investment (£2.6 billion) and higher nominal consumer spending due to higher inflation (£2.4 billion). The fiscal forecast error of £1.5 billion largely reflects the timing of receipts at the start and end of the financial year (£1.8 billion). Subsequent policy announcements increased VAT receipts by £0.1 billion.

Onshore corporation tax

3.15 Onshore corporation tax receipts have consistently come in higher than expected through the pandemic and more recently. Outturn receipts of £72.5 billion in 2022-23 were £24.3 billion (50.5 per cent) and £15.6 billion (27.5 per cent) higher than the March 2021 and March 2022 forecasts respectively.

³ See Table 4.3 in the March 2023 EFO.

The public finances

- Of the £24.3 billion overshoot against the March 2021 forecast, around three-quarters comes from higher payments of tax by non-oil, non-financial companies and the rest from financial sector companies. Cumulative profit growth of non-oil, non-financial companies was just over 3 percentage points higher than assumed in the March 2021 forecast, while financial company profits are estimated to have risen by 50 per cent rather than the 13 per cent assumed in the March 2021 forecast. These stronger economic determinants explain £7.7 billion of the overshoot with much of the rest due to fiscal forecasting differences. This is likely to be due to a combination of the starting point for the forecast (e.g. the outturn for the previous year) proving too low and a stronger pre-measures effective tax rate.
- The £15.6 billion overshoot in receipts relative to the March 2022 forecast were from both non-oil, non-financial companies (£14.2 billion) and from financial companies (£4.3 billion). Profit growth of non-oil, non-financial companies rose by 7.3 per cent in 2022 against a forecast fall of 1.4 per cent. Profits rose despite higher wage and energy costs (possibly partly helped by the government energy schemes). Financial company profits were also 11 per cent higher than we assumed in the March 2022 forecast. This explained £6.8 billion of the overshoot with the rest explained by fiscal forecasting differences. As with the March 2021 forecast, a combination of a too low starting point and a higher-than-expected effective tax rate are likely to be the key drivers.

3.16 The starting point for our March forecasts will be heavily influenced by the latest estimate for receipts for the previous year. With most corporation tax paid with a lag, cash receipts in 2021-22 and 2022-23 will often relate to profits in the previous year (and accrue back to that year). These consistently surprised on the upside. The latest accrued corporation tax outturns for both 2021-22 and 2022-23 are over £8 billion higher than the estimates used for the March 2021 and March 2022 forecasts. In addition, ONS data on non-oil, non-financial profits has generally been revised up from the vintages used when making these forecasts.

3.17 A higher-than-expected effective tax rate is likely to be partly due to the strength of receipts being concentrated in a few relatively tax-rich sectors of the economy and among very large companies. Chart 3.3 in the January 2023 *Forecast evaluation report* shows the variation in the effective tax rate between sectors with the financial sector, professional services and retail all having a relatively high effective tax rate on their profits. Profits and the effective tax rate on those profits in the financial sector in 2022-23 benefited from the rise in net interest margins of retail banks. We also assumed in these forecasts that not all of the unexplained strength (over and above that explained by economic determinants and other factors) would push through to future years. It looks like this proved to be a too pessimistic assumption.

Other receipts

3.18 **Fuel duties** in 2022-23 were £25.1 billion. This fell short of our March 2021 forecast by £4.1 billion largely due to policy changes announced in Spring Statement 2022 including the duty freeze costing £1.5 billion and the temporary 5p reduction in main rates of petrol and diesel costing £2.4 billion. Compared to our March 2022 forecast, receipts were £1.1 billion lower, of which £0.3 billion is explained by economic factors and a further £0.2

billion is explained by an in-year forecast error for 2021-22. The remaining fiscal error of £0.5 billion is due to higher-than-expected petrol and diesel prices (£0.2 billion) and other fiscal modelling factors.

- 3.19 Air passenger duty (APD)** in 2022-23 was £3.3 billion. This was £1.2 billion and £0.4 billion above our March 2021 and March 2022 forecasts respectively. This reflects a stronger post-Covid recovery in air travel than anticipated.
- 3.20 Tobacco duty** receipts in 2022-23 were £9.4 billion. This was £0.1 billion and £1.6 billion below our March 2021 and March 2022 forecasts respectively. £0.6 billion of our March 2022 error is due to the timing of receipts around the start and the end of the financial year, and the rest is explained by tobacco receipts falling from their peaks quicker than expected after the pandemic.
- 3.21 Customs duty** receipts were £5.4 billion in 2022-23. This was £2.3 billion above our March 2021 forecast. This is due to lower-than-expected utilisation of the preferential treatment on offer under the free-trade agreement with the EU and higher-than-expected electric vehicle imports from outside the EU, as explained in Box 3.1 of our January 2023 Forecast evaluation report. We have since updated our assumptions resulting in a smaller underestimate of £49 million (0.9 per cent) against our March 2022 forecast.
- 3.22 The UK emission trading scheme (ETS)** receipts were £5.8 billion in 2022-23. This was £4.6 billion above our March 2021 forecast and only £36 million above our March 2022 forecasts, respectively. Of the March 2021 error, higher-than-anticipated carbon price explains £4.0 billion and the remaining error is explained by higher-than-expected numbers of allowances.
- 3.23 Capital gains tax receipts** in 2022-23 were £16.9 billion. This was £6.2 billion and £2.0 billion higher compared to our March 2021 and March 2022 forecasts respectively. Both surpluses are almost entirely explained by fiscal forecasting differences, reflecting the small number of high-value financial asset disposals in 2021-22 (like SA income tax, CGT receipts largely relate to liabilities in the previous financial year).
- 3.24 Inheritance tax receipts** in 2022-23 were £7.1 billion. This was £1.3 billion and £0.4 billion higher compared to our March 2021 and March 2022 forecasts respectively. The surplus from March 2021 is partly explained by stronger than expected growth in house prices and cash deposits. The March 2022 forecast difference is largely due to a fiscal forecast difference, reflecting higher deaths than forecast and a small number of large payments.
- 3.25 Stamp duty land tax receipts** in 2022-23 were £15.4 billion. This was £2.0 billion above our March 2021 forecast but £0.4 billion below our March 2022 forecast. The March 2021 forecast difference is largely related to stronger growth in the housing market than expected, while the March 2022 forecast difference is more than explained by the September policy measure to increase the nil-rate band thresholds. For both forecasts, there is a positive fiscal forecast difference which may reflect a greater number of high value property transactions than assumed in the model.

The public finances

- 3.26 UK oil and gas receipts** (including offshore corporation tax, petroleum revenue tax and the energy profits levy) reached £9.5 billion in 2022-23. This was £9.1 billion higher than March 2021's forecast, and £1.7 billion higher than our March 2022 forecast. For both the March 2021 and March 2022 forecasts, the Energy profits levy (EPL) introduced in May 2022 brought in £3.9 billion of unanticipated receipts. The remaining difference for the March 2021 forecast is due to much higher oil and gas prices. For March 2022, the EPL receipts surprise was partially offset by offshore corporation tax receipts coming in lower than expected by £2.2 billion (28 per cent). Lower receipts were driven by underlying fiscal forecast errors potentially including that the gas prices achieved by firms have been lower than the market prices assumed because of hedging and forward sales.
- 3.27 Business rates** in 2022-23 were £28.3 billion. This was £3.3 billion and £1.2 billion lower than our March 2021 forecast and March 2022 forecast respectively. The 2021 Autumn Budget announcements to freeze the business rates multiplier for 2022-23 and provide relief for some retail, hospitality and leisure businesses explain around £2.5 billion of the March 2021 forecast difference.
- 3.28 Interest and dividend receipts** in 2022-23 were £31.1 billion. This was £4.7 billion above our March 2021 forecast and £0.2 billion lower than our March 2022 forecast. Higher than expected interest rates have pushed up the return on the government's financial assets such as bank deposits and foreign exchange reserves. This explained £3.7 billion of the difference in March 2021 and £1.1 billion of the difference in March 2022.

Table 3.2: Breakdown of March 2021 receipts forecast differences for 2022-23

	£ billion						
	Difference, of which:						Fiscal forecast difference
	Forecast	Outturn	Total	Classification changes	Policy changes	Economic factors	
Income tax and NICs	361.3	427.0	65.7	0.0	6.1	47.3	12.3
Value added tax (VAT)	145.6	162.1	16.5	0.0	0.8	13.7	2.0
Onshore corporation tax	48.1	72.5	24.3	0.0	-0.6	7.7	17.2
Fuel duties	29.2	25.1	-4.1	0.0	-3.9	1.4	-1.6
Business rates	31.6	28.3	-3.3	0.0	-2.5	0.4	-1.2
Stamp duty land tax ¹	13.4	15.4	2.0	0.0	-0.8	1.6	1.2
Air passenger duty	2.0	3.3	1.2	0.0	0.0	0.0	1.2
Tobacco duties	9.4	9.4	-0.1	0.0	0.0	0.2	-0.3
Alcohol duties	12.7	12.4	-0.3	0.0	-0.7	0.2	0.2
Environmental levies	10.0	6.6	-3.4	0.7	0.0	0.3	-4.4
UK ETS auction receipts	1.2	5.8	4.6	0.0	0.0	0.0	4.6
Other taxes ²	128.1	155.9	27.8	0.0	4.0	11.6	12.2
National Accounts taxes	792.8	923.7	130.9	0.7	2.4	84.3	43.4
Interest and dividends	26.4	31.1	4.7	0.7	0.8	3.7	-0.5
Gross operating surplus	62.2	66.1	3.9	0.0	0.0	0.0	3.9
Other non-tax receipts	4.0	2.1	-1.9	0.0	0.0	0.0	-1.9
Current receipts	885.4	1,023	137.5	1.4	3.2	88.0	44.9

¹ Excludes Scottish LBTT.

² Excludes Scottish LFT and Welsh LBT.

Table 3.3: Breakdown of March 2022 receipts forecast differences for 2022-23

	£ billion						
	Forecast	Outturn	Total	Difference, of which:			Fiscal forecast difference
				Classification changes	Policy changes	Economic factors	
Income tax and NICs	424.5	427.0	2.6	0.0	-6.4	7.2	1.8
Value added tax (VAT)	154.2	162.1	7.9	0.0	0.1	6.3	1.5
Onshore corporation tax	56.8	72.5	15.6	0.0	-1.6	6.8	10.4
Fuel duties	26.2	25.1	-1.1	0.0	0.0	-0.3	-0.7
Business rates	29.5	28.3	-1.2	0.0	0.0	0.0	-1.2
Stamp duty land tax ¹	15.8	15.4	-0.4	0.0	-0.8	-0.9	1.2
Air passenger duty	2.9	3.3	0.4	0.0	0.0	0.0	0.4
Tobacco duties	10.9	9.4	-1.6	0.0	0.0	0.1	-1.7
Alcohol duties	12.7	12.4	-0.3	0.0	-0.1	0.0	-0.2
Environmental levies	6.9	6.6	-0.3	0.7	0.0	0.0	-1.0
UK ETS auction receipts	5.8	5.8	0.0	0.0	0.0	0.0	0.0
Other taxes ²	147.3	155.9	8.6	0.0	3.9	1.9	2.8
National Accounts taxes	893.3	923.7	30.3	0.7	-4.9	21.1	13.4
Interest and dividends	31.3	31.1	-0.2	0.0	0.0	1.1	-1.3
Gross operating surplus	59.7	66.1	6.4	0.0	0.0	0.0	6.4
Other non-tax receipts	3.1	2.1	-1.1	0.0	0.0	0.0	-1.1
Current receipts	987.5	1,023	35.5	0.7	-4.9	22.2	17.5

¹ Excludes Scottish LBTT.

² Excludes Scottish LFT and Welsh LBT.

Spending

3.29 Spending in 2023-23 was £1.15 trillion. This was £159.1 billion (13.8 per cent) higher than our March 2021 and £64.8 billion (5.6 per cent) higher than our March 2022 forecast (summarised in Table 3.4 and 3.5). The key drivers of the large differences from our forecasts are:

- **Inflation and interest rates** rose much faster than we had expected in either our March 2021 or March 2022 forecast as set out in Chapter 2. This meant debt interest payments were the largest driver of the difference between forecast and outturn for both the March 2021 (£87.0 billion or four-and-a-half times higher) and March 2022 (£28.6 billion or 34 per cent higher) forecasts.
- The Government's **policy response to the energy crisis** pushed spending higher than both our March 2021 and March 2022 forecast. In our March 2022 forecast the cost of energy support policies totalled £12.3 billion. In the summer of 2022, a raft of further policies were announced, including energy schemes to subsidise bills for households and businesses, and cost-of-living payments to support households, bringing the eventual total net cost to £51.1 billion in 2022-23. Box 3.1 analyses the total cost of the Government's response to the energy crisis.

- **Other policy changes** also contributed to the spending forecast difference. Most notably, departmental resource spending (RDEL) was higher in outturn than both our March 2021 and March 2022 forecasts, by £49.1 billion (13.6 per cent) and £4.6 billion (1.1 per cent) respectively. The March 2021 difference was largely due to a £39.0 billion increase in the Treasury limit for resource spending in the October 2021 Spending Review, which included additional spending on health and social care and other public services hit by the pandemic.
- **Other fiscal forecasting differences** include a £5.0 billion capital grant within the public sector for the Bank of England’s Asset Purchase Facility. Within welfare spending, the lasting effect of the pandemic on increasing disability benefit and health-related UC caseloads also pushed up spending compared to both our March 2021 and March 2022 forecasts.

Table 3.4: Breakdown of March 2021 spending forecast differences for 2022-23

	£ billion					
	Forecast	Outturn	Total	Difference, of which:		
				Classification changes	Policy changes	Other
PSCE in RDEL	362.4	411.5	49.1	-2.9	52.1	-0.1
Welfare spending	254.9	261.5	6.6	0.0	5.2	1.5
Net debt interest payments	24.5	111.5	87.0	0.7	0.0	86.3
Energy schemes ¹	0.0	27.1	27.1	0.0	27.1	0.0
Other current expenditure	224.5	234.8	10.4	2.9	6.5	1.0
Current expenditure	866.3	1,046	180.2	0.7	90.8	88.7
PSGI in CDEL	86.6	89.9	3.3	0.0	2.7	0.6
Student loans	11.7	2.0	-9.6	0.0	-10.3	0.7
Other capital expenditure	27.8	12.9	-14.8	0.0	-1.1	-13.7
Gross investment	126.1	104.9	-21.2	0.0	-8.7	-12.4
Less depreciation	-59.1	-57.3	1.8	0.0	0.0	1.8
Net investment	67.0	47.6	-19.3	0.0	-8.7	-10.6
Total spending	992.3	1,151	159.1	0.7	82.1	76.3

¹Combines the domestic energy price guarantee and the non-domestic energy bills relief scheme

Note: Some spending outturn data, notably for local authorities, was not available at the time we closed this report to new data, so we rely on our latest (March 2023) forecasts.

Table 3.5: Breakdown of March 2022 spending forecast differences for 2022-23

	£ billion					
	Forecast	Outturn	Total	Difference, of which :		
				Classification changes	Policy changes	Other
PSCE in RDEL	407.0	411.5	4.6	-2.9	10.3	-2.8
Welfare spending	250.3	261.5	11.2	0.0	8.4	2.8
Net debt interest payments	83.0	111.5	28.6	0.0	0.0	28.6
Energy schemes ¹	0.0	27.1	27.1	0.0	27.1	0.0
Other current expenditure	232.7	234.8	2.1	2.9	0.0	-0.8
Current expenditure	973.0	1,046	73.5	0.0	45.8	27.7
PSGI in CDEL	86.0	89.9	3.9	0.0	1.3	2.6
Student loans	2.9	2.0	-0.9	0.0	0.0	-0.9
Other capital expenditure	24.7	12.9	-11.8	0.0	0.0	-11.8
Gross investment	113.6	104.9	-8.7	0.0	1.3	-10.1
<i>Less depreciation</i>	<i>-57.2</i>	<i>-57.3</i>	<i>-0.1</i>	<i>0.0</i>	<i>0.0</i>	<i>-0.1</i>
Net investment	56.4	47.6	-8.8	0.0	1.3	-10.1
Total spending	1,087	1,151	64.8	0.0	47.1	17.6

¹Combines the domestic energy price guarantee and the non-domestic energy bills relief scheme

Note: Some spending outturn data, notably for local authorities, was not available at the time we closed this report to new data, so we rely on our latest (March 2023) forecasts.

Box 3.1: The cost of the Government's energy support policies

Russia's invasion of Ukraine in late February 2022 led to a surge in wholesale and retail energy prices, and a subsequent rise in inflation to a four-decade high. To support households and businesses, the Government introduced a series of policies during 2022 which were a key factor pushing spending and borrowing outturn in 2022-23 above both our March 2021 and March 2022 forecasts. This box examines how the costs associated with this policy response in 2022-23 evolved over successive forecasts and in initial outturn (summarised in Chart A).

In our **March 2022 forecast**, completed shortly after the invasion, we expected total energy support to cost £12.3 billion (less than 1 per cent of GDP) based on the measures announced by Chancellor Sunak in the March 2022 Budget. Over financial year 2022-23:

- the **energy bills support scheme (EBSS)**, a £200 energy bills discount to all households in October 2022 was estimated to cost £6.0 billion;
- a £150 **council tax rebate**, to be paid to most households in April 2022, was expected to cost £2.9 billion; and
- other support consisted of a **5p cut in fuel duty**, expected to cost £2.4 billion, and the **bailout of Bulb Energy** which we expected to cost £1.0 billion.

By the time of our **November 2022 forecast**, the Government announced a series of additional measures to support households and business, which increased our forecast of the total cost of energy support in 2022-23 to £67.1 billion (2.7 per cent of GDP). The key additional measures whose costs were reflected in our November 2022 forecast included:

- a May 2022 package of **cost-of-living payments to households** which added £9.2 billion of spending. This package consisted of a one-off payment to those on means-tested, pension-age, and disability benefits.
- the **windfall taxes on energy producers** via the energy profits levy (EPL) and the electricity generator levy (EGL). Combined, we forecast the EPL and EGL to raise £7.1 billion, with over four-fifths of that from the EPL.
- the **EBSS** was also expanded in May 2022 to £400 discount on household energy bills in October. This added another £6.0 billion to the cost of this scheme, bringing the total cost of the EBSS to £12.0 billion.
- the **energy price guarantee (EPG)** announced in September 2022 capped annual energy bills for a typical household at £2,500 from October to the end of 2022-23.^a We initially expected this to cost £24.8 billion.
- the **energy bill relief scheme (EBRS)** performed the same role as the EPG for businesses, and we included a cost of £18.4 billion.
- our estimate of the cost of the **Bulb Energy bailout** rose to £4.6 billion because of the rise in wholesale energy costs.

In our **March 2023 forecast**, we revised down the total cost of the energy support package in 2022-23 to £52.2 billion largely due to:

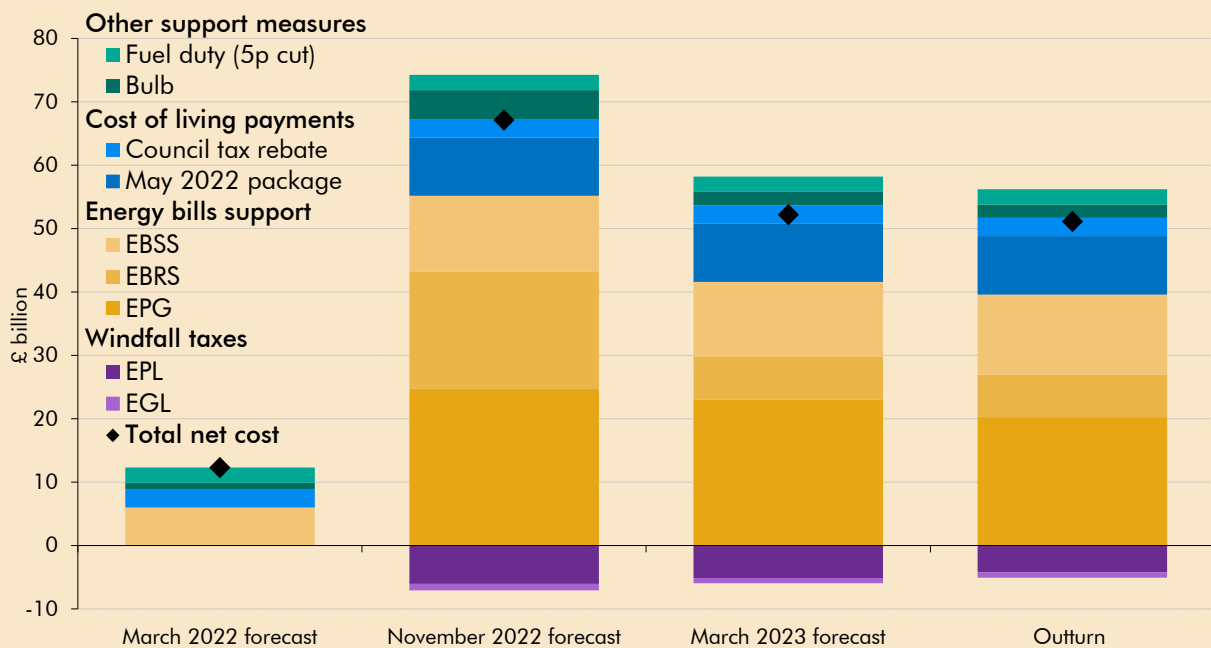
- the cost of the **EPG** was revised down from £24.8 billion to £23.0 billion: of this, there was a £1.7 billion downwards revision due to lower-than-expected energy use, slightly offset by a rise of £0.3 billion due to higher energy prices. The lag in changes in wholesale energy prices impacting retail energy prices due to the Ofgem price cap meant that the fall in wholesale energy prices between our November 2022 and March 2023 forecasts was reflected in a much lower expected cost for the EPG in the following financial year, 2023-24, rather than in 2022-23.^b
- we made a more significant downwards revision of £11.7 billion to the cost of the **EBRS**, bringing the cost in 2022-23 down to £6.7 billion. Just over one-third of this downward revision was due to sharp falls in wholesale energy prices (£2.8 billion) and lower discounts than we had expected (£1.6 billion). The remaining two-thirds (£7.3 billion) was a result of lower volumes of eligible energy use, reflecting lower overall energy use during a warm autumn and early winter, and a lower share of energy use being eligible for the scheme.
- the cost of the **Bulb Energy bailout** was revised down from £4.6 billion to £2.1 billion on the back of the Government reducing the allotted sums for the two facilities it extended to Bulb.

- receipts from the **windfall taxes** were revised down by £7.1 billion to £6.0 billion due to lower wholesale energy prices.

Initial outturn data shows that the total net cost of energy support policies in 2022-23 was £51.1 billion in 2022-23 (2.0 per cent of GDP). This was £38.8 billion above our March 2022 forecast but £16.1 billion and £1.1 billion below our November 2022 and March 2023 forecasts, respectively. Around two thirds (£41.6 billion) of the gross cost of this support went on energy bills support (EBSS, EPG and EBRS), with the remaining fifth mostly spend on wider cost-of-living payments and council tax rebate (£12.1 billion). Just under 9.0 per cent of the gross cost was offset via windfall taxes on energy producers.

Many of the policies introduced in response to the energy crisis extend into 2023-24 and beyond. In our March 2023 forecast, we projected the net costs in 2023-24 to be £11.3 billion (0.4 per cent of GDP). From 2024-25 onwards, of all the policies described in this box, only the windfall taxes continue to impact the public finances. We expect them to raise £6.8 billion (0.3 per cent of GDP) on average over the remaining four years of our forecast.^c

Chart A: Total cost of energy support policies in 2022-23



Source: DESNZ, OBR

^a The EPG extended in to 2023-24, ending in June. Initially, the £2,500 cap on a typical annual household energy bill applied to the whole period but the cap was raised to £3,000 from April 2023 in the November 2022 Autumn Statement.

^b Household energy bills are adjusted for expected changes in wholesale gas and electricity prices every three months via the Ofgem price gap.

^c See Box 3.1 of the March 2023 EFO.

Departmental spending

- 3.30** Our forecasts for departmental spending are premised on Government plans (as required by our legislation) and these plans can and do change. For years covered by periodic Spending Reviews, we base our DEL forecasts on detailed spending limits given to departments by the Treasury, making only small adjustments for expected in-year underspends. For years outside of Spending Reviews, the Government indicates how much it plans to spend in total in resource and capital DELs, with no departmental breakdown.
- 3.31** In our recent review of the OBR's forecast performance since 2010, we found that a frequent source of difference between our spending forecasts and outturn is when governments replace the latter indicative aggregate spending plans with detailed department-by-department spending limits at Spending Reviews. Since the OBR's establishment, the average revision to DEL spending at the time a Spending Review takes place was an increase of £14.3 billion a year.⁴ The £39.5 billion upward revision to total DEL spending in 2022-23 at the October 2021 Spending Review therefore fits this pattern.
- 3.32** Overall departmental spending totalled £501.3 billion in 2022-23, £52.3 billion (11.6 per cent) higher than our March 2021 forecast and £8.4 billion (1.7 per cent) higher than our March 2022 forecast. In Table 3.6, we break this difference into resource and capital spending, then split each into (i) changes in Treasury spending limits, (ii) changes in our judgement about how much departments would actually spend compared to these limits ('underspending'), and (iii) classification changes:
- **Resource spending** was £49.1 billion (13.6 per cent) higher than our March 2021 forecast and £4.6 billion (1.1 per cent) higher than our March 2022 forecast. The March 2021 forecast difference largely reflects the £39.0 billion increase in the Treasury limit for departmental resource spending at the October 2021 Spending Review. Treasury limits were also increased by much smaller amounts in all three subsequent fiscal events: by £6.7 billion in March 2022, £6.4 billion in November 2022 and £2.3 billion March 2023. The March 2022 forecast difference captures the latter two increases. In both forecasts, these increases were slightly offset by higher-than-expected underspending and a classification change due to railway subsidies being moved out of the private sector into public corporations.
 - **Capital spending** outturn was £3.2 billion (3.7 per cent) higher than our March 2021 forecast and £3.8 billion (4.4 per cent) higher than our March 2022 forecast. This reflects that fact the Treasury's capital spending limits were little changed from either forecast (at £0.7 billion higher and lower, respectively) but departments spent more of this budget than we had expected (underspending was lower by £2.4 billion and £4.5 billion, respectively). The latter likely reflects high inflation putting greater-than-expected pressure on departmental capital budgets.

⁴ See Atkins, G., and Lanskey, L, *Working paper No. 19: The OBR's forecast performance*, August 2023.

Table 3.6: Breakdown of March 2021 and March 2022 DEL forecast differences for 2022-23

	£ billion	
	Actual resource spending	Actual capital spending
March 2021 forecast	362.4	86.6
Outturn	411.5	89.8
Difference	49.1	3.2
<i>of which:</i>		
Treasury limits	54.4	0.7
Underspending	-2.4	2.4
Classification changes	-2.9	0.0
March 2022 forecast	407.0	86.0
Outturn	411.5	89.8
Difference	4.6	3.8
<i>of which:</i>		
Treasury limits	8.7	-0.7
Underspending	-1.3	4.5
Classification changes	-2.9	0.0

Note: A positive number for underspending represents an increase in actual spending.

Welfare spending

3.33 Welfare spending in 2022-23 reached £261.5 billion. This was £6.6 billion (2.6 per cent) higher than expected in our March 2021 forecast and £11.2 billion (4.5 per cent) higher than our March 2022 forecast. These differences can be mainly attributed to:

- the **cost-of-living payments** introduced as part of the May 2022 package amounted to £8.4 billion in 2022-23, more than explaining the March 2021 error and the vast majority of the March 2022 error.
- **Pensioner benefit spending.** Compared to our March 2021 forecast, pensioner spending was £2.4 billion lower in outturn. This majority of this is explained by the suspension of the triple lock at Autumn Budget 2021 for 2022-23. Higher-than-expected earnings would have increased the cost of the triple lock by £2.9 billion, however the policy's saving of £4.6 billion yielded a net decrease of £1.7 billion to pensioner spending. Pensioner spending was £0.7 billion lower than our March 2022 forecast, of which £0.6 billion was due to revisions to the cost and profile of DWP's state pension underpayments correction exercise.
- **UC and its legacy equivalents.** Compared to our March 2021 forecast, UC and legacy spending was only £0.3 billion lower, with the effect of lower-than-expected unemployment reducing UC by £3.7 billion) mostly offset by the policy decision to reduce the taper on earnings (costing £2.1 billion) and higher uprating (£0.9 billion). Big downward revisions to UC spending due to legacy benefit modelling improvements in March 2022 Spring Statement were more than offset by large upward revisions at the subsequent two fiscal events due to higher-than-expected health-related and in-work UC caseloads. These upward revisions explain the majority of why UC and legacy spending was £2.8 billion higher than our March 2022 forecast.

The public finances

- **Disability benefits.** Spending on disability benefits was higher in outturn than both our March 2021 (£1.7 billion higher) and March 2022 forecasts (£0.9 billion higher). Both of these can be explained by successive upward forecast revisions due to higher-than-expected onflows to the PIP and DLA caseloads following the pandemic.⁵
- **Child benefit** spending was £0.2 billion lower than forecast in March 2021, mostly due to lower-than-expected take-up due to Covid and lower-than-expected births.

Table 3.7: Breakdown of our March 2021 and March 2022 welfare forecast differences for 2022-23

	£ billion					
	Forecast	Outturn	Difference, of which:			
			Total	Policy	Economic	Other
March 2021						
Total welfare spending	254.9	261.5	6.6	5.2	1.8	-0.3
<i>of which:</i>						
Pensioner spending ¹	124.8	122.4	-2.4	-5.0	3.8	-1.2
UC and legacy equivalents ²	74.5	74.1	-0.3	1.8	-2.8	0.7
Disability benefits ³	27.4	29.1	1.7	0.1	0.4	1.2
Child benefit	11.8	11.6	-0.2	0.0	0.1	-0.2
Cost-of-living payments	0.0	8.4	8.4	8.3	0.0	0.1
Other spending ⁴	16.5	15.9	-0.5	0.0	0.3	-0.8
March 2022						
Total welfare spending	250.3	261.5	11.2	8.4	-0.6	3.4
<i>of which:</i>						
Pensioner spending ¹	123.0	122.4	-0.7	0.0	0.0	-0.7
UC and legacy equivalents ²	71.3	74.1	2.8	0.0	-0.6	3.4
Disability benefits ³	28.2	29.1	0.9	0.1	0.0	0.8
Child benefit	11.6	11.6	0.0	0.0	0.0	0.0
Cost-of-living payments	0.0	8.4	8.4	8.3	0.0	0.1
Other spending ⁴	16.1	15.9	-0.2	0.0	0.0	-0.2

¹ Pensioner spending includes pensioner housing benefit, pension credit, state pension expenditure and winter fuel payments.

² UC and legacy equivalents includes personal tax credits, housing benefit (excluding pensioner part), incapacity benefits, contributory ESA, income support and income-based and contributory jobseeker's allowance. It also includes industrial injuries benefit—the Scottish element of which is devolved to Scotland.

³ Disability benefits includes disability living allowance, personal independence payment and attendance allowance.

⁴ Other spending includes child benefit and Northern Ireland social security expenditure.

Debt interest spending

3.34 Outturn debt interest spending in 2022-23 was £111.5 billion. This was £87.0 billion (four-and-a-half times) higher than our March 2021 forecast (Table 3.8) and £28.6 billion (34.4 per cent) higher than our March 2022 forecast (Table 3.9). These large differences reflect higher-than-forecast paths for inflation (as outlined in paragraph 2.7) and interest rates (paragraph 2.5), alongside smaller contributions from classification changes and financing:

⁵ For more information, see: OBR, *Supplementary forecast information release: Upward revisions to welfare spending since March, November 2022*.

- Higher inflation leading to larger **uplifts on index-linked gilts (ILGs)** accounted for £57.7 billion of the March 2021 forecast difference and £15.8 billion of the March 2022 difference. Outturn RPI inflation, which acts on the £566 billion stock of index-linked gilts (in 2022-23), was 7.8 per cent in January 2022 and 13.4 per cent in January 2023, compared to the 2.3 per cent and 2.2 per cent forecast in March 2021 and 7.8 per cent and 10.1 per cent forecast in March 2022⁶. The rise in debt interest spending through ILGs is explained in more detail in Chapter 4 of our *Fiscal risks and sustainability report 2023*.
- Higher interest rates, with both **higher gilt and Bank rate than forecast**, drove increased spending through gilts, National Savings and Investment (NS&I) products and the Asset Purchase Facility (APF). This accounted for £28.7 billion of the March 2021 overshoot and £12.0 billion of the March 2022 overshoot. This reflected the higher-than-forecast path for Bank rate which increased the payments made from the APF above the fixed-rate coupon payments into it. Bank rate was 0.2 per cent in 2021-22 and 2.3 per cent in 2022-23 compared to the 0.0 per cent and 0.1 per cent forecast in March 2021 and 0.2 per cent and 1.4 per cent in March 2022. There was a small offsetting impact from the **volume of gilt purchases** made by the APF of £0.2 billion compared to the March 2021 forecast.
- A change in the **classification of corporate bond receipts in the APF and leases (outside of the APF)** prior to our October 2021 and March 2022 forecasts, which increased spending relative to our March 2021 forecast by a combined £1.9 billion, with no change compared to our March 2022 forecast.
- A small offset from lower-than-forecast expenditure on **financing and other factors** in March 2021 by £1.1 billion, but an increase relative to our March 2022 forecast of £0.8 billion.

⁶ The most relevant RPI change driving financial year expenditure on index-linked debt is inflation in the year to January, which reflects the lag associated with the majority of this debt.

Table 3.8: Breakdown of our March 2021 debt interest spending forecast differences for 2022-23

	£ billion		
	Outturn	Forecast	Difference
Central government debt interest, net of APF	111.5	24.5	87.0
<i>of which:</i>			
Central government debt interest	108.1	41.1	67.1
<i>of which:</i>			
Interest rates			9.3
Inflation			57.7
Financing and other factors			-1.1
Classification changes			1.2
Asset Purchase Facility	3.4	-16.6	20.0
<i>of which:</i>			
Interest rates			19.4
Volume of gilt purchases			-0.2
Classification changes			0.7
<i>Memo: Public sector net debt</i>	2,538	2,616	-78

Table 3.9: Breakdown of our March 2022 debt interest spending forecast differences for 2022-23

	£ billion		
	Outturn	Forecast	Difference
Central government debt interest, net of APF	111.5	83.0	28.6
<i>of which:</i>			
Central government debt interest	108.1	87.2	21.0
<i>of which:</i>			
Interest rates			4.3
Inflation			15.8
Financing and other factors			0.8
Classification changes			0.0
Asset Purchase Facility	3.4	-4.2	7.6
<i>of which:</i>			
Interest rates			7.6
Volume of gilt purchases			0.0
Classification changes			0.0
<i>Memo: Public sector net debt</i>	2,538	2,453	85

Public sector net debt

3.35 The level of public sector net debt (PSND) was 98.0 per cent of GDP in 2022-23. This was 10.4 percentage points lower than forecast in March 2021 (Table 3.10) but 2.5 percentage points above our March 2022 forecast (Table 3.11). This reflects:

- **Nominal GDP**, which was £176.7 billion (7.3 per cent) higher-than-expected in March 2021 and contributed around (7.4 percentage points) of the undershoot. Our March 2022 forecast underestimated nominal GDP by £20.4 billion, reducing the size of the overall overshoot by 0.8 percentage points.

- **Cash debt at the end of 2021-22**, which was £117.7 billion lower-than-forecast in March 2021, representing 4.5 percentage points of the undershoot relating to that forecast. It was £52.8 billion higher than forecast in March 2022, 2 percentage points of the overshoot.
- **Debt accumulation through 2022-23**, which was higher than forecast in both March 2021 and March 2022, raising debt relative to both forecasts by 1.5 percentage points and 1.2 percentage points respectively. The contributions to the changes in cash debt through 2022-23 are discussed further below.

3.36 The change in PSND through 2022-23 was £155.9 billion, £40.0 billion (34.6 per cent) higher than our March 2021 forecast and £32.2 billion (26.0 per cent) than our March 2022 forecast. This can be explained by the following:

- **Public sector net borrowing (PSNB)**, which was higher than forecast in both March 2021 and March 2022, by £21.5 billion (20.1 per cent) and £29.3 billion (29.5 per cent) respectively, for the reasons set out earlier in this chapter.
- **Gilt premia** valuation effects, which increased PSND by £23.5 billion rather than reducing it, as forecast in March 2021 and March 2022. This reflected the sharp fall in gilt prices which occurred through 2022-23, reducing the face (or redemption) value of gilt liabilities below that of the cash raised upon their issuance.
- **Bank of England schemes**, comprising the Asset Purchase Facility (APF) and the Term Funding Scheme (TFS), which reduced debt by £31.0 billion, £31.7 billion more than the modest increase in debt we had forecast in March 2021 and £19.6 billion more than the reduction forecast in March 2022. This reflected the larger-than-forecast reductions in both the Bank's corporate bond holdings in the APF and the liabilities associated with the TFS.
- **Other factors**, reflecting a number of timing and valuation effects, which raised debt by £19.2 billion more than forecast in March 2021, but by £6.5 billion less than forecast in March 2022.

Table 3.10: Breakdown of March 2021 PSND forecast differences for 2022-23

	£ billion		
	Outturn	Forecast	Difference
Per cent of GDP	98.0	108.4	-10.4
<i>of which:</i>			
Nominal GDP			-7.4
Cash debt at end 2021-22			-4.5
Change in cash debt 2022-23			1.5
£ billion	155.9	115.9	40.0
<i>of which:</i>			
PSNB			21.5
Bank of England Schemes			-31.7
Gilt premia			31.0
Other			19.2
<i>Memo: Public sector net debt</i>	<i>2,538</i>	<i>2,616</i>	

Table 3.11: Breakdown of March 2022 PSND forecast differences for 2022-23

	£ billion		
	Outturn	Forecast	Difference
Per cent of GDP	98.0	95.5	2.5
<i>of which:</i>			
Nominal GDP			-0.8
Cash debt at end 2021-22			2.0
Change in cash debt 2022-23			1.2
£ billion	155.9	123.7	32.2
<i>of which:</i>			
PSNB			29.3
Bank of England Schemes			-19.6
Gilt premia			29.0
Other			-6.5
<i>Memo: Public sector net debt</i>	<i>2,538</i>	<i>2,453</i>	

4 Refining our forecasts

Introduction

- 4.1 We strive to provide transparency around our forecasts, to facilitate understanding and to ensure that we can be held to account for the judgements we make. Transparency makes us scrutinise our forecasts in detail, examining and explaining the inevitable differences between those forecasts and subsequent outturns. This will help people gauge whether our forecasts are based on impartial professional judgement, rather than politically motivated wishful thinking. The process also affords an opportunity to learn lessons that can be applied to future forecasts.
- 4.2 In this chapter, we summarise:
- Lessons learnt from forecasting the economy and public finances; and
 - Actual and planned improvements to our models for economic and fiscal forecasting.

Lessons learnt

- 4.3 The context for this *Forecast evaluation report* is once again a significant externally-driven shock. Following the Covid pandemic which was the theme of our previous report, the more recent shock was the Russian invasion of Ukraine and the subsequent shock to energy, food and other commodity prices. Relative to our March 2021 forecast, the main driver of difference in outturns in 2022-23 was the direct and indirect impacts of the February 2022 invasion. Relative to our March 2022 forecast, the main differences are driven by the longer than anticipated duration of the ensuing war; the severity of subsequent sanctions by the international community; the path of global inflation and interest rates – and the effects that these factors had on the UK Government’s response, UK inflation and economic activity.
- 4.4 As with the Covid pandemic shock, there are significant challenges in forecasting the economic impact of a significant exogenous shocks like the invasion by Russia of the Ukraine. The subsequent energy and food price shock was without precedent in the era of independent inflation-targeting central banks. In terms of how we responded to these shocks and the lessons we can learn from evaluating outturns relative to our past forecasts:
- As explained in detail in Box 2.1, we examined the literature on the effect of historical energy price shocks on inflation and adjusted our CPI forecast accordingly. But the indirect effect of energy prices on inflation appears to have been greater than we expected likely due to some combination of underestimating the non-linearities associated with already-elevated inflation and overestimating the speed at which the

labour market would loosen. We'll take this larger energy price pass through into account in our Autumn 2023 forecast.

- As explained in Box 2.2, real household disposable income appears to have held up more than expected. Part of this reflects tax data, some of which might be revised. Another part reflects the relative pass through of higher Bank Rate to deposit interest income and mortgage interest payments. We will review all of these assumptions in our Autumn 2023 forecast.

4.5 On the fiscal side, the main 2022-23 forecast differences can be explained by economic factors: higher inflation resulting in stronger growth in nominal tax bases; higher inflation and interest rates pushing debt interest spending higher; successive waves of Government support to households and businesses with the cost of energy and wider cost of living. Of the remaining forecast differences, the following lessons have been learnt:

- The **receipts** overshoot against both the March 2021 and 2022 forecasts shows the importance of looking at nominal as well as real economy trends. In-year receipts data has recently been stronger than indicated by latest data for key nominal tax bases, particularly for onshore corporation tax. Early ONS data on profits is very provisional, so we have put more focus on sectoral trends and the source of differences (e.g. payments from very large companies compared with those from small companies). However, this remains an area for further analysis and we are working with HMRC to improve their forecasting model.
- The October 2021 Spending Review led to a £39.5 billion (1.6 per cent of GDP) increase in our **departmental spending** forecast, which is conditioned on Government's stated plans (as required by Parliament). Significant additions to Departmental expenditure limits are common at the time of Spending Reviews, a pattern which has become a major source of fiscal forecast differences for us in recent years.¹ We analysed the Government's post-Spending Review period assumptions in our November 2022 *EFO* and will be reflecting on the implications of this for the centrality of our future forecasts.²
- In our **welfare** forecast, new onflows to PIP remained high in the aftermath of the pandemic. In response, we revised up our assumptions about how long new claims would remain elevated, taking greater account of recent outturn data. We implemented these changes in the March 2023 *EFO*.

¹ See Atkins, G and Lanskey, L, *Working paper No.19: The OBR's forecast performance*, August 2023.

² See Box 3.1.

Review of forecasting models

Economy forecast models

4.6 As is usually the case, we have used some of the time between the Spring and Autumn *EFOs* to review, update and expand the range of models that we use to inform our forecasts. Given our underestimation of the persistence of wage growth and inflation in recent quarters, we have placed particular emphasis on our modelling in these areas. Some of the modelling work we have done includes:

- We have enhanced the range of statistical and econometric equations which are used to inform our short-term inflation forecast.
- We have also reviewed our models used to inform the forecasts for tradables inflation and wage growth. For the former, we are examining whether we can find a way to more accurately reflect the effect of energy prices on the price of other goods and services and for the latter, examine which measures of labour market slack provide the best predictive power of wage growth.
- We have reviewed the rate at which the capital stock is scrapped which has an impact on our productivity forecast through its effect on capital deepening. We previously expected this rate to be flat over the forecast period. However, this rate has been rising in recent years as the share of intangible assets (which have a shorter expected lifespan) in the capital stock has risen. And we now expect this upward trend to continue over the forecast period.
- We use scenario analysis as one of the tools to assess the risks around our central forecast. This has traditionally been done using a variety of tools, including our small 4-equation model.³ We have recently acquired and started using The National Institute Global Economic Model (NiGEM) which allows us to model the effects of different forecast judgements and shocks quickly and in a general equilibrium framework. We have also used NiGEM to inform our assessment of the economic effects of government policy.
- In partnership with the Treasury, we are developing an overlapping generations (OLG) model for the analysis of structural shocks and the long-run impacts of government policy to complement our analysis of their medium-term effects.
- To assess the impact temporary capital allowances have on investment and the macroeconomy over time, we have developed new tools that allow us to consider in more detail general equilibrium effects and the incentives forward-looking businesses face to shift investment over time.

³ See OBR, *Working paper No.4: A small model of the UK economy*, July 2012.

Fiscal forecast models

- 4.7 In 2016, we introduced a more systematic approach to following up modelling issues revealed by our analysis of fiscal forecasting errors in *Forecast evaluation reports (FERs)* and raised in forecasting rounds while preparing *EFOs*. We have been working closely with our partners across government in doing so. We described the criteria and analysis we deploy when reviewing fiscal forecast models in Chapter 4 of our 2016 *FER*.
- 4.8 For this year's *Forecast evaluation report*, we have published an updated 'model assessment database' on our website, which reviews progress against previously identified priorities, and outlines new priorities for 2023. Given the tight timescales to produce our last report after the unusual November 2022 *EFO* process, we did not publish an updated model assessment database, so this represents the first since our 2021 *FER*. Nonetheless, in our last *FER*, we did provide a partial update on model developments and set out key priorities for the upcoming year. We have summarised these key developments below as well as the main forecast priorities for the year ahead.

Progress against previously identified modelling priorities

- 4.9 The following progress has been made against previously identified priorities:
- The ONS updated its **depreciation model** in July 2022 to use a perpetual inventory method, which includes sector-level aggregated capital stock data. We engaged with the Treasury in early January 2023, on the development of a new forecast model that would be closely aligned with ONS PIM model methodology. Testing and evaluation has taken place throughout the year with a dual-run scheduled for November's fiscal event.
 - We have refined our **PAYE income tax** forecast methods to make use of extensive analysis undertaken by HMRC into the distribution of taxable income and to make better use of more granular and timely real time information (RTI) earnings data on the distribution of incomes. This analysis allows us to better estimate the population marginal tax rate.
 - We have improved the methodology for forecasting **local authority net lending**, which is used to derive local authorities' debt interest payments to different sources of borrowing, by making it consistent with the main borrowing forecast. Further improvements include incorporating the DMO's forecast for repayments they receive from the public works loan board borrowing and our interest rate forecasts.
 - For forecasting **universal credit**, we have made significant progress on accounting for fraud and error, with better modelling for both the total number of overpayments made across the forecast period and for the share of those overpayments we expect to be identified and recovered. There have also been further developments to INFORM2 (the microsimulation model that underpins our UC forecasts), particularly in

improvements regarding child element forecasting such as a better birth rate model and better capture of children joining the caseload that are not births (for example, due to custody changes, fostering or adoption).

- To forecast **departmental underspends**, we now use a wider range of information consisting of both cash management data and information from OSCAR. We have worked with the Treasury to better understand each source and the different signals they give about departmental underspending.

Future forecast developments

4.10 As outlined in the database, we are focusing on the following forecast models for development activity in the coming year:

- On **income tax**, we continue to develop a deeper understanding of the self-assessment income tax base which poses challenges when forecasting due to lags in available data. We will build on further analysis by our HMRC colleagues to improve our forecasting of growth in bonus income.
- As noted in Chapter 3, **onshore corporation tax** receipts have been much stronger than anticipated. While factors such as higher-than-expected profits and the sectoral distribution of profits are clear drivers behind the strength in receipts, we have worked with HMRC to develop their model with an aim to reduce complexity and making the model more transparent. The intention is to use the revised model for the Autumn forecast.
- We have made significant changes to the **VAT** model since the March forecast. The previous version used an econometric model to determine the share of spending subject to the 20 per cent VAT rate (the standard rated share). This model could not account for the large increase in energy prices, subject to the reduced rate (5 per cent) and the large increase in food prices (which are mostly zero rated), reducing the standard rated share and subsequently reducing VAT receipts. In the March forecast we applied a manual adjustment to correct the model and account for the rise in energy and food prices. Our new VAT model uses the breakdown of our nominal consumption forecast, to project standard rated, reduced rated, exempt, and zero-rated consumption. Our nominal consumption forecast already accounts for changes in energy and food prices and, as a result, these are now fully incorporated into our new VAT model removing the need to manually account for them through judgements. Our intention is to use the new VAT model for the Autumn forecast.
- We are working with analysts in HMRC to revisit the price elasticity assumptions in our **alcohols** and **tobacco** models. These assumptions determine how future duty rate rises and price inflation will impact demand for alcohol and tobacco products. Furthermore, we are reviewing our trend assumptions in the tobacco model to better account for the growing popularity of e-cigarettes and heated tobacco products and the resulting substitution away from traditional tobacco products. Our intention is to implement these changes in the Autumn forecast.

Refining our forecasts

- We are conducting a review of our **locally financed expenditure** model by engaging with the relevant stakeholders who provide inputs into the forecast. As local authorities also receive funding through central government grants, we are engaging with HM Treasury agreeing a consistent approach to recording this for net local authority expenditure. We also plan further engagement with ONS on local government and public corporations team on the interactions between outturn data and our forecasts.
- We are continuing to develop INFORM2 outputs and fraud and error modelling, both of which feed into our **universal credit** forecast. We are focussed on breaking down the different elements of Universal Credit in addition to conditionality groups (particularly the housing element), and improving the short-term forecast. We are reviewing the methodology for forecasting overpayments to increase consistency between the assumptions underpinning our fraud and error and debt forecasts.
- We have simplified our model for forecasting **funded public sector pension schemes**. We plan to engage further with the ONS to further build a shared understanding of the data and how this affects our forecast. We also plan to do more work to ensure modelling assumptions are consistent with other OBR assumptions, particularly the economy forecast and the unfunded public service pension schemes forecast.

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