

PROSPECTS FOR THE UK ECONOMY

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Section 1. Forecast overview and policy recommendations

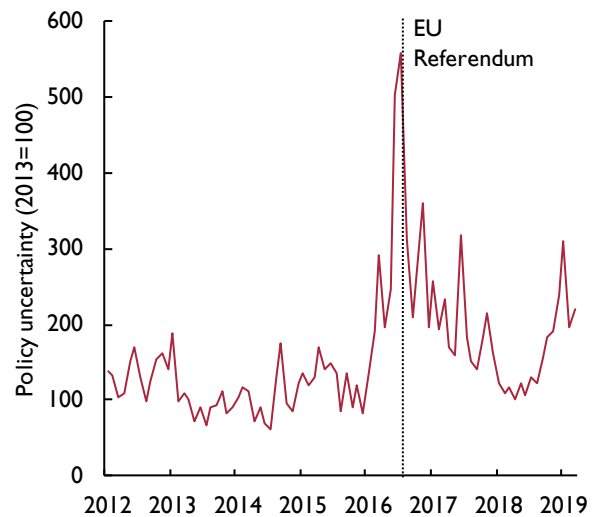
The main development since our last forecast is that the United Kingdom's exit from the European Union did not take place on 29 March as had been planned. Instead, the exit date has been pushed back to 31 October 2019, with the possibility of leaving earlier if some way around the existing parliamentary impasse can be found before then.

This means that the recent period of high political and economic uncertainty is set to continue and probably intensify. The set of possible options for Brexit remains as wide as ever. At the same time, the difficulty of reaching parliamentary agreement on a path to Brexit has led to deep public dissatisfaction with national decision making that could lead to new political alliances and a change of government.

Uncertainty has now reached such a chronic level that it has become one of the most important factors affecting the short-term economic outlook (figure 1).¹ Evidence from the Bank of England/Nottingham/Stanford Decision Maker Panel (DMP) suggests that Brexit uncertainty is now one of the top three sources of uncertainty for 54 per cent of senior executives from participating businesses, compared with 37 per cent in the immediate aftermath of the EU referendum.

There is growing evidence that three years of Brexit-related uncertainty have taken their toll of the UK economy, in many ways in the manner expected (Chadha, Johnson and van Reenen, 2016). Planned

Figure 1. Policy uncertainty in the UK



Source: www.policyuncertainty.com, NIESR.

investment projects have been deferred, cancelled or moved abroad. Bloom, Chen and Mizen (2018) estimate that Brexit-related uncertainty was associated with around 6 percentage points less investment growth in the two years following the EU referendum. Breinlich, Leromain, Novy and Sampson (2019) estimate that the number of new investments made by UK firms in European Union (EU) countries is 12 per cent higher than it would otherwise have been. In addition, resources

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have been diverted from normal business activity to Brexit preparation in both public and private sectors to the detriment of more valuable activity. For example, the proportion of senior executives spending more than one hour a week on Brexit planning increased to 43 per cent in November 2018 to January 2019, from 21 per cent a year earlier according to the DMP. In addition, productivity growth has continued at a slow pace since the EU referendum, although it is not clear that this is due to Brexit-related uncertainty as productivity growth has been slow also in other countries.

The slowdown in UK GDP growth relative to other countries since the EU referendum is also consistent with Brexit-related uncertainty having an adverse impact (figure 2). By comparing the experience of the UK and other countries before and after the EU referendum, Born, Müller, Schularick and Sedlacek (2019) estimate that by the end of 2018 the UK economy was around 2½ per cent smaller than it would otherwise have been. On top of this effect, household real incomes have also been reduced by the effects of the shift in the terms of trade associated with the real depreciation of sterling that followed the EU referendum. Per capita real household income is estimated to have been around 4 per cent lower than it would otherwise have been by the middle of 2018, worth around £900 per year to the average household (Carney, 2018).

The economy has been cushioned from the adverse demand-side effects of higher uncertainty by more

stimulatory monetary policy, with interest rates being held lower than would otherwise have been the case. The adjustment to lower demand has been achieved without an enduring pick-up in inflation or material disruption to the labour market. CPI inflation was back to 1.9 per cent in March, having risen above 3 per cent in the immediate aftermath of the EU referendum when sterling depreciated. Employment has grown by almost a million, and the unemployment rate has fallen by over a percentage point since the middle of 2016. The growth in employment has contributed to a significant improvement in the public finances. In March, the Office for Budget Responsibility (OBR) estimated that public sector net borrowing would be 1.1 per cent of GDP in 2018–19, around 1 percentage point lower than it had expected in November 2016. This improvement is partly due to lower than expected debt interest payments, worth £5 billion in 2018–19 alone, associated with more stimulatory monetary policy.

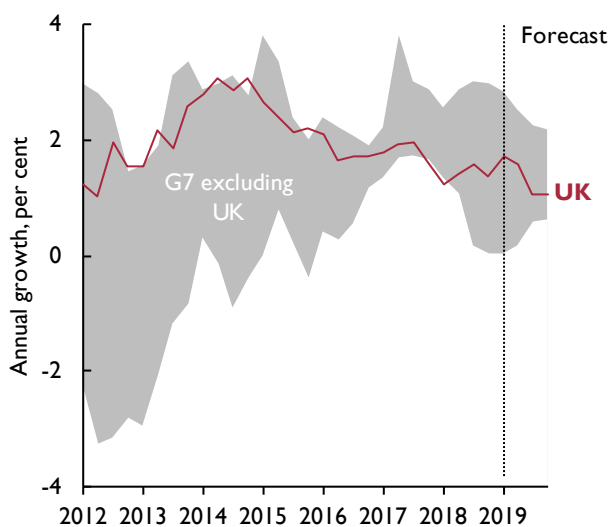
One apparent consequence of the adjustment to Brexit-related uncertainty is that the economy remains unbalanced, with aggregate demand very reliant on consumers' expenditure underpinned by an unsustainably low saving ratio. Low interest rates and a competitive exchange rate have failed to stimulate business investment and exports, as might have been expected in more normal times, probably because businesses are uncertain about what capital and investment in export markets will be needed in the future. Instead, a higher share of aggregate spending has been met from consumers' expenditure and housing investment. As a consequence, aggregate saving remains low and much of the finance for aggregate investment has been sourced from abroad via a current account deficit of around 4 per cent of GDP in 2018.

Uncertainty is bound to remain elevated until the final Brexit outcome is known. It risks becoming a structural feature of the UK economy, thereby operating not only through economic confidence, i.e. demand-side channels, but increasingly also affecting the productive capacity of the economy.

Recent developments and central forecast

The first quarter of 2019 in particular was a period of intense uncertainty. Despite this, our latest GDP Tracker estimate is that the economy grew by 0.4 per cent in the first quarter of 2019, and is on track to grow at a broadly similar pace in the second quarter. All of the major sectors appear to have made a positive contribution to GDP growth in the first quarter as a whole, partly reflecting a recovery in production and construction from a notably

Figure 2. UK GDP growth against G7 growth



Source: NIESR.

Box A. Brexit assumptions and alternative scenarios

Our main-case forecast is based on the assumption of a 'soft' Brexit. But several alternative outcomes are still possible. In this box, we compare our main case with scenarios in which the UK remains a member of the EU, negotiates a customs union or exits without a deal at the end of the extended Article 50 period on 31 October.

Soft Brexit assumptions

Our main forecast is based on the assumption that the UK retains access to the EU's single market and customs union. It is assumed that this outcome crystallises after a period of heightened uncertainty reflected in higher-than-average investment premiums and delayed improvements of business investment, consumption and productivity. The scenario may emerge as the result of various political developments, including a cross-party compromise, multiple votes in Parliament that lead to an elimination of other options (Aidt *et al.*, 2019) and/or a referendum.

In our main forecast scenario the UK would exit on 31 October, enter a transition period until the end of 2020 during which details of future trading arrangements are negotiated, and after 2020 would continue to make substantial contributions to the EU budget while remaining a member of the EU's programmes. In this scenario an open border between Northern Ireland and the Republic of Ireland would be maintained but the UK would lose political influence on EU decision-making.

Alternative scenarios

Continued EU membership. In this scenario the UK decides to stay a member of the EU, its single market and customs union. This scenario could come about as the result of decisions made by parliament and government to revoke Article 50 by the end of October 2019 and/or a referendum. Compared to our main 'soft Brexit' case, uncertainty is assumed to lift more rapidly in this scenario, the exchange rate appreciates and productivity growth recovers more strongly (see also 'Stay' scenario in Hantzsche *et al.*, 2018).

Customs union. Similar to our main case, the UK would enter a transition period after 31 October while uncertainty remains elevated for as long as negotiations about the future trading relationship continue. After the end of a transition, the UK enters a customs union with the EU in 2021 that guarantees frictionless trade in goods. The UK would, however, exit the European single market. As a result, we assume that services trade in particular would face higher non-tariff barriers that reduce overall EU-UK trade in the long run by 30 per cent, compared to a soft Brexit or continued EU membership. Foreign direct investment, productivity and net migration would be lower in the long run compared to softer Brexit scenarios, and fiscal contributions to the EU budget are assumed to be reduced by one half (see also 'Deal + Backstop' scenario in Hantzsche *et al.*, 2018).

Orderly no deal. If no agreement can be reached on the UK's future trading relationship with the EU and a withdrawal agreement is not ratified by 31 October, the UK might revert to trade with the EU on WTO terms. We assume that the transition is orderly: short-term contingency measures are put in place and financial stability is safeguarded. In the long run, we assume in line with empirical evidence that EU-UK trade is 56 per cent lower compared to continued EU single market and customs union membership as a result of tariff and non-tariff barriers; net migration would be reduced by 100,000 persons a year, foreign direct investment be 24 per cent lower, labour productivity be lower by 1.6 per cent and the UK would no longer contribute to the EU budget once outstanding liabilities were repaid (see also 'no-deal' scenario in Hantzsche *et al.*, 2018).

Comparing the economic impact

In the near term, our main forecast is consistent with a range of alternative Brexit outcomes, provided a transition period guarantees frictionless access to the EU single market and customs union (table A1, figure A1). If by October 2019 the UK

Table A1. Economic impact of different Brexit scenarios

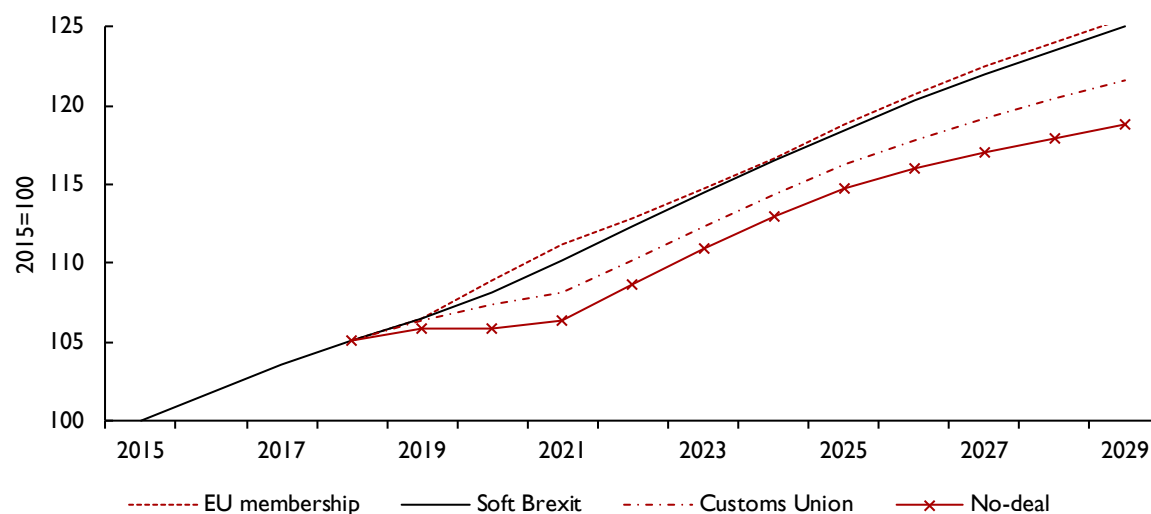
	Short-run economic impact (2019/20)	Long-run economic impact (10 years out) (relative to continued EU membership)
Soft Brexit (main forecast)	Heightened uncertainty weighs down on investment, consumption and productivity until the end of 2020	GDP: -0.4% GDP per capita: -0.4%
Customs union	Heightened uncertainty and expectations of trade frictions weigh down on investment, consumption and productivity	GDP: -3.1% GDP per capita: -2.3%
Orderly no-deal	Severe uncertainty tariff and non-tariff barriers weigh down on trade and productivity	GDP: -5.4% GDP per capita: -3.7%

Box A. (continued)

committed to stay in the EU, we would expect the fog of uncertainty to lift more quickly than in the main forecast, providing a boost to GDP growth in the near term. By contrast, a no-deal exit by the end of the year would lead to significant disruption to trade and investment. In the February 2019 *Review*, we showed how monetary and fiscal policy could be used to ease the transition of the economy to trade on WTO terms through discretionary policy measures (Hantzsche and Kara, 2019).¹

The long-term economic implications of continued EU membership are nearly indistinguishable from the assumptions underlying our main forecast based on a 'soft' Brexit, though the costs of the uncertainty already incurred are not recouped. By contrast, any sizeable trade barriers would lead to less rapid improvements in income and welfare over time compared to EU membership. As a result of non-tariff trade barriers associated with exiting the single market, GDP per capita is estimated to be 2.3 per cent lower in the Customs Union scenario relative to continued EU membership. In the orderly no-deal scenario, GDP per capita is estimated to be 3.7 per cent smaller than under EU membership, or 5.4 per cent in GDP terms. The difference is smaller than in the government's estimates from November 2018 (–6.3 per cent to –10.7 per cent, HM Government, 2018) but larger than in the IMF's recently published estimates (around –3 per cent, IMF, 2019).

Figure A1. The impact of different Brexit scenarios on real GDP



Source: NIESR, NiGEM simulation.

NOTES

¹ Here we assume that monetary policy reacts in a mechanical manner to inflation and the output gap based on NiGEM's default policy rule. Automatic fiscal stabilisers are activated but not accompanied by additional discretionary spending.

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This box was prepared by Arno Hantzsche and Garry Young.

weak performance at the end of 2018. Manufacturing output was on track to rise by 1.1 per cent in the first quarter. Survey evidence suggests that the relatively strong performance of manufacturing in the first quarter was partly due to stockpiling ahead of Brexit, either by businesses building up their own inventories or to meet stockpiling demands by clients.

Signs of a tightening labour market are building as businesses have to some extent substituted labour for capital. In particular, wages are now growing at an annual rate of around 3½ per cent. With little productivity growth this means that unit labour costs are growing at an annual rate of 3 per cent, putting upward pressure on inflation.

Alongside domestic uncertainty, the global economy is also going through a soft patch as outlined in the World Economy chapter of this *Review*. Global growth slowed materially in the second half of 2018, affecting external demand for UK goods and services in the short term. The slowdown in global demand also appears to be associated with a weakening of core inflation in the major economies. This will reduce some of the upward pressure on import prices and so be helpful in offsetting emerging domestically-generated inflationary pressure.

Against this background of uncertainty, our main-case forecast is based on a ‘soft’ Brexit assumption where the UK and EU continue to maintain a high level of access to each other’s markets for goods and services for the foreseeable future. In this main case, the UK leaves the EU on 31 October 2019 in a manner close to the negotiated withdrawal agreement, followed by a transition period that forms a bridge to the to-be-negotiated future relationship. Our main-case forecast assumes that the future relationship will involve the same trading arrangements as if the UK stayed a member of the EU. This effectively assumes that the UK remains a member of the EU customs union and adheres to single market rules, as would be the case in the so-called ‘Norway-plus’ option.

We believe that our main-case scenario is the most likely outcome because it would be consistent with maintaining an open border between the UK and EU on the island of Ireland. But even though it is the most likely outcome we would put the odds of it occurring at less than evens. There are clearly many other possible future Brexit scenarios that are different to our main case, but most of them, apart from no deal, would involve a similar short-term economic outlook. This is because most would involve a continuation of similar short-term trading

arrangements between the UK and the EU and other countries as long as they allow for a transition period or involve an extension of the article 50 period. They would also entail a continuation of the uncertainty over the future relationship that has cast a pall over long-term planning, inhibiting clear decision making and decisive action that is likely to persist until the shape of the future relationship becomes clear.

The key exception to our main-case scenario that would affect the short-term economic outlook is where the UK leaves the EU without a deal. While parliament has put in place legislation to prevent no deal, parliament can change its mind, or the European Council might reject a third extension of the article 50 period. Betting markets put the odds of a no-deal Brexit at about one in eight.

Our estimates of the long-term economic consequences of different Brexit outcomes are set out in Box A.

Our main-case forecast is broadly for a continuation of current economic conditions. There appears to be little spare capacity domestically. If correct, this means that the UK economy will not be able to grow much faster than its potential of around 2 per cent per year, accounted for by labour force growth of ½ per cent per year and productivity growth of 1½ per cent per year. GDP is forecast to grow by around 1½ per cent in 2019 and 2020, and then pick up to close to 2 per cent as the global economy recovers and domestic demand accelerates, led by government consumption and investment.

CPI inflation is forecast to remain around 2 per cent per annum as faster unit labour cost growth is offset by slower import price inflation. Unemployment, which stayed at 3.9 per cent of the labour force in the three months to February, is expected to remain at around 4 per cent. The current account deficit is forecast to fall from 4.2 per cent of GDP in 2019 to around 3 per cent in 2020, as domestic saving picks up relative to investment.

There has been little change to our main-case forecast since February, partly because we continue to condition the forecast on an assumption that there will be a ‘soft’ Brexit. The most material change in our view is that we no longer expect Bank Rate to be raised this year. This reflects the effects of extended uncertainty at home, weaker global outlook, less global inflation and a shift to a more accommodative monetary policy stance in other countries.

As has been emphasised, there is significant uncertainty around the economic outlook. Our assessment of the risks

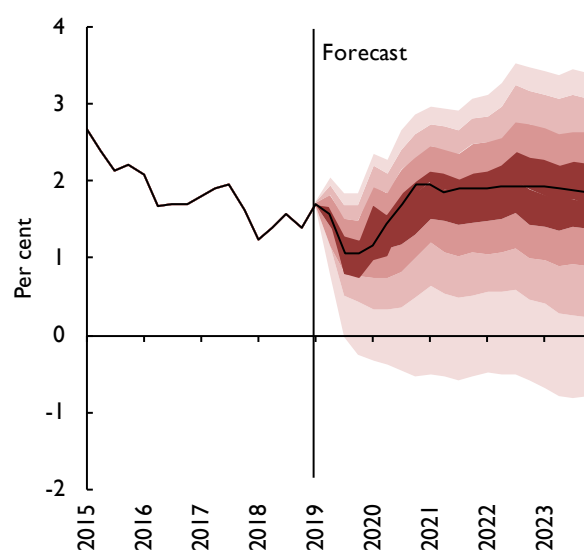
Table 1. Summary of the forecast

Percentage change unless otherwise stated

	2015	2016	2017	2018	2019	2020	2021	2022	2023
GDP	2.3	1.8	1.8	1.4	1.4	1.6	1.9	1.9	1.9
Per capita GDP	1.5	1.0	1.2	0.8	0.7	1.0	1.3	1.4	1.4
CPI Inflation	0.1	0.7	2.7	2.4	1.8	2.0	2.0	2.0	2.0
RPDI	5.2	0.0	0.4	2.1	2.0	2.3	2.4	2.4	2.3
Unemployment, %	5.4	4.9	4.4	4.1	3.9	4.1	4.0	4.0	4.0
Bank Rate, %	0.5	0.4	0.3	0.6	0.8	0.9	1.1	1.2	1.4
Long Rates, %	1.8	1.3	1.2	1.4	1.2	1.6	2.0	2.3	2.7
Effective exchange rate	5.6	-10.0	-5.3	2.1	1.8	0.6	0.2	0.3	0.3
Current account as % of GDP	-4.9	-5.2	-3.3	-3.9	-4.2	-3.1	-2.8	-2.4	-2.0
Net borrowing as % of GDP ^(a)	3.8	2.3	2	1.3	1.7	2.1	2.3	2.3	2.2
Net debt as % of GDP ^(a)	82.9	85.5	85.4	83.5	82.1	79.9	77.2	77.7	76.9

Notes: RPDI is real personal disposable income. PSNB is public sector net borrowing. PSND is public sector net debt. (a) Fiscal year, excludes the impact of financial sector interventions, but includes the flows from the Asset Purchase Facility of the Bank of England. Annual averages unless stated otherwise.

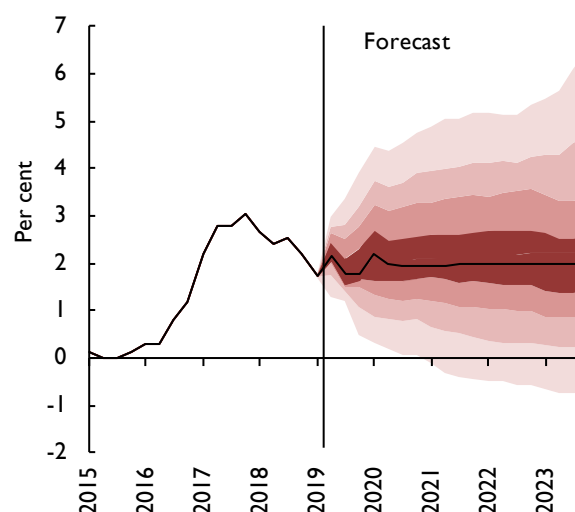
Figure 3. GDP growth fan chart (per cent per annum)



Source: NiGEM database, NIESR forecast and NiGEM stochastic simulations.

Note: Each bound represents a cumulative decile of the probability distribution around the May 2019 forecast. There is a 20% chance that GDP growth will lie outside the shaded area of the fan.

Figure 4. Inflation fan chart (per cent per annum)



Source: NiGEM database, NIESR forecast and NiGEM stochastic simulations.

Note: Each bound represents a cumulative decile of the probability distribution around the May 2019 forecast. There is a 20% chance that inflation will lie outside the shaded area of the fan. The Bank of England's inflation target is 2 per cent per annum.

for GDP growth and inflation are set out in figures 3 and 4 that show the probability of different future outcomes for GDP growth and CPI inflation. The distribution for future GDP growth is skewed to the downside to reflect the risk of economically damaging no-deal outcomes to the Brexit process. Conversely, the distribution for CPI inflation is skewed to the upside.

These forecast distributions are more pessimistic in the short term than those published by the Warwick Business School Forecasting System (WBSFS), which combine state-of-the-art statistical models weighted solely by the forecasting performance of each model (Box B). On their forecasts, there is a 10 per cent chance that four-quarter GDP growth for the final quarter of 2019 will be

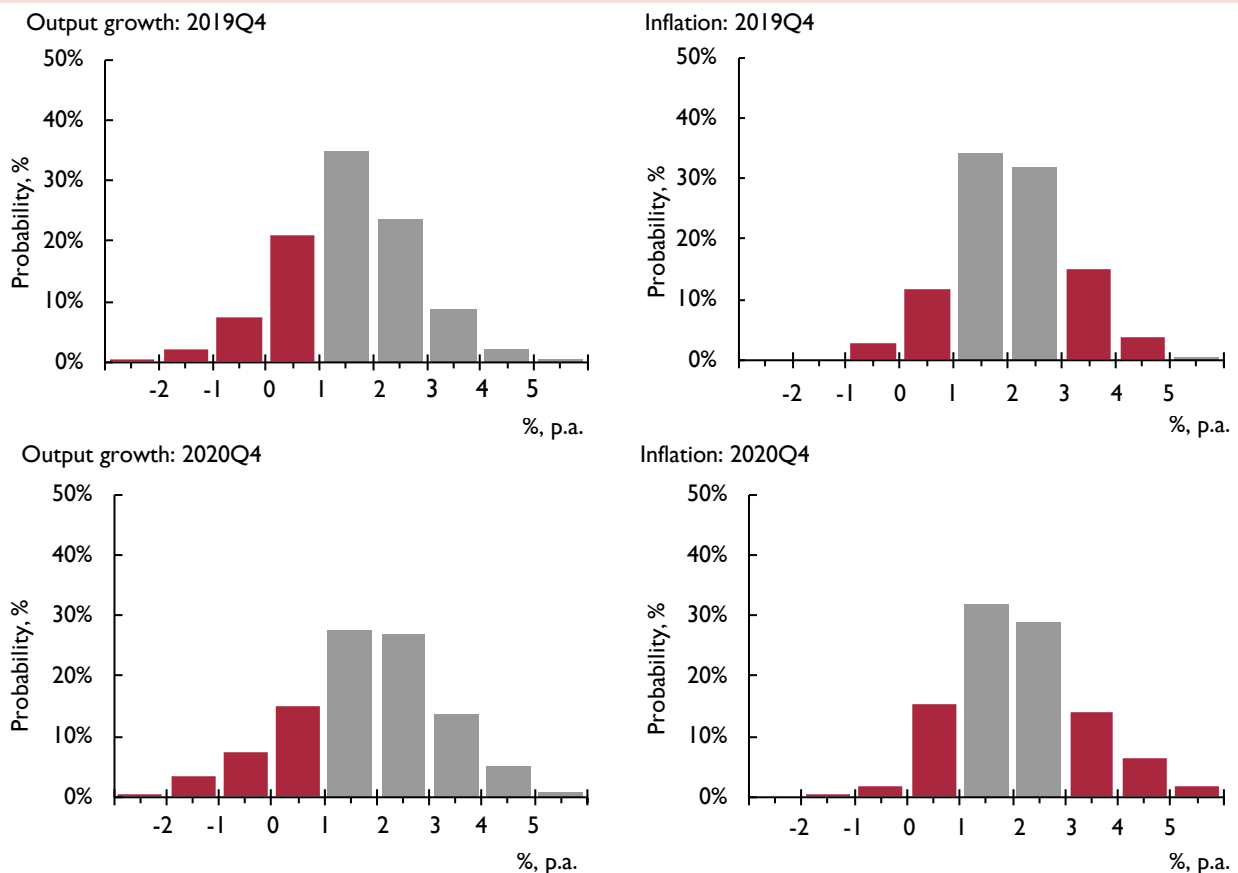
Box B. Forecasting with a benchmark: the Warwick Business School forecasting system

We provide benchmark forecasts to help understand and contextualise the forecasts presented in this Review. The box presents density forecasts for UK GDP annual growth and inflation, and reports the probabilities of a range of output and inflation events occurring, as calculated using the Warwick Business School Forecasting System (WBSFS).¹

To reflect the uncertainties inherent in economic forecasting, and following the practice of NIESR and other forecasters such as the Bank of England and OBR, the WBSFS provides probabilistic forecasts. The WBSFS forecasts are produced by explicitly combining density forecasts from a set of 24, statistically motivated, univariate and multivariate econometric models commonly used in the academic literature. The use of combination forecasts or model averaging reflects the view, supported by research (e.g., see Bates and Granger, 1969; Wallis, 2011; Geweke and Amisano, 2012; Rossi, 2013), that because any single model may be mis-specified there may be gains from the use of combination forecasts.

Comparison of the Institute’s forecasts with the probabilistic forecasts from the WBSFS may be interpreted as providing an approximate indicator of the importance of expert judgement, which may include views on the underlying structure of the macroeconomy. This is because the WBSFS forecasts are computed by exploiting regularities in past data with the aid of automated time-series models; they do not take an explicit, structural or theoretical view about how the macroeconomy works; and they do not rely on (subjective) expert judgement to the same degree as those presented by the Institute. The forecasts from the WBSFS are not altered once produced; they are deemed ‘simply’ to represent the data’s view of what will happen to the macroeconomy in the future.

Figure B1. WBSFS forecast probabilities for real GDP growth and inflation, year-on-year



Note: To aid visualisation, output growth forecast outcomes greater than 1 per cent are coloured grey, red otherwise. For inflation, grey outcomes are defined as inflation within the Bank of England’s target range of 1–3 per cent, such that the Governor does not have to write a letter of explanation to the Chancellor; forecast outcomes outside that are coloured red.

Box B. (continued)

Figure B1 presents WBSFS's latest (as of 5 April 2019) probabilistic forecasts for real GDP growth and inflation – defined as year-on-year growth rates for 2019Q4 and 2020Q4 – as histograms. The information set used to produce these forecasts includes information on GDP growth up to 2018Q3 and data on CPI inflation up to February 2019.

Table B1 extracts from these histogram forecasts the probabilities of specific output growth and inflation events. The events considered are the probability of output growth being less than 0 per cent, 1 per cent and 2 per cent, and of inflation lying outside the 1–3 per cent target range (i.e., the probability of the Bank of England's Governor having to write a letter explaining how and why inflation has breached its target range). Also reported are the individual probabilities of inflation being less than 1 per cent and greater than 3 per cent, to indicate which side of the target range is most likely to be breached.

Table B1. Probability event forecasts for 2019Q4 and 2020Q4 annualised % real GDP growth and CPI inflation (extracted from the WBSFS forecast histograms)

Year	Real GDP growth (% p.a.)			CPI inflation (% p.a.)		
	Prob(growth<0%)	Prob(growth<1%)	Prob(growth<2%)	Prob(letter)	Prob(CPI<1%)	Prob(CPI>3%)
Updated Forecasts (April 2019)						
2019Q4	10%	30%	65%	34%	15%	19%
2020Q4	11%	26%	54%	39%	17%	22%
Previous Forecasts (January 2019)						
2019Q4	8%	27%	58%	36%	11%	25%
2020Q4	9%	24%	50%	42%	16%	26%

Examination in table B1 of the output growth forecasts for 2019Q4 suggests that, compared with our forecasts made one quarter ago, there is a small increase in the probabilities of lower growth. The most likely outcome in 2019Q4 remains growth between 1 per cent and 2 per cent, with a forecasted probability of 35 per cent, up from 31 per cent last quarter. The risk of 'low' growth (growth less than 1 per cent) in 2019Q4 is forecast to be slightly higher compared to one quarter ago: the predictive probability of this event has increased from 27 per cent to 30 per cent. In turn, the chance that growth exceeds 2 per cent has dropped from 42 per cent one quarter ago to 35 per cent.

Looking further ahead to 2020Q4 we forecast a higher chance that growth exceeds 2 per cent: the probability forecast rises from 35 per cent this year to 46 per cent next year. But this is still slightly lower than the 50 per cent chance we gave to this event one quarter ago, consistent with this downward shift in our growth forecasts.

For inflation, our probabilistic forecasts for 2019Q4 have also changed little between January and April. The probability of inflation falling outside 1–3 per cent has decreased, but only by 2 percentage points from 36 to 34 per cent. This change is attributable to a slight leftward shift in the inflation density for 2019Q4, such that the probability of inflation exceeding 3 per cent is now forecast to be 19 per cent rather than 25 per cent one quarter ago. This represents a modest continuation of the downward movements observed in our inflation forecasts last year. Looking further ahead to 2020Q4, although the forecast uncertainties are unsurprisingly higher as evidenced by a wider range of forecast outcomes than for 2019Q4, we also forecast a similar pattern. Relative to our forecasts made one quarter ago, this slight downward trend in inflation is forecast to continue through to 2020Q4 with the probability of inflation exceeding 3 per cent falling from 26 per cent one quarter ago to 22 per cent.

NOTE

1 WBSFS forecasts for UK output growth and inflation have been released every quarter since November 2014. Details of the releases are available at <https://www2.warwick.ac.uk/fac/soc/wbs/subjects/emf/forecasting/> and a description of the models in the system and of the indicators employed is available at https://www2.warwick.ac.uk/fac/soc/wbs/subjects/emf/forecasting/summary_of_wbs_forecastng_system.pdf.

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This box was prepared by Ana Galvão, Anthony Garratt and James Mitchell.

negative and a 30 per cent chance that it will be less than 1 per cent. Our own estimate is that the chance of negative four-quarter growth at the end of 2019 is about 15 per cent and the chance of growth of less than 1 per cent is closer to 50 per cent, largely reflecting the material risk of a damaging no-deal Brexit outcome. Similarly, the WBSFS model points to around a 20 per cent chance that CPI inflation will exceed 3 per cent for both the final quarters of 2018 and 2019, whereas we would put the chance of above 3 per cent inflation at around 40 per cent.

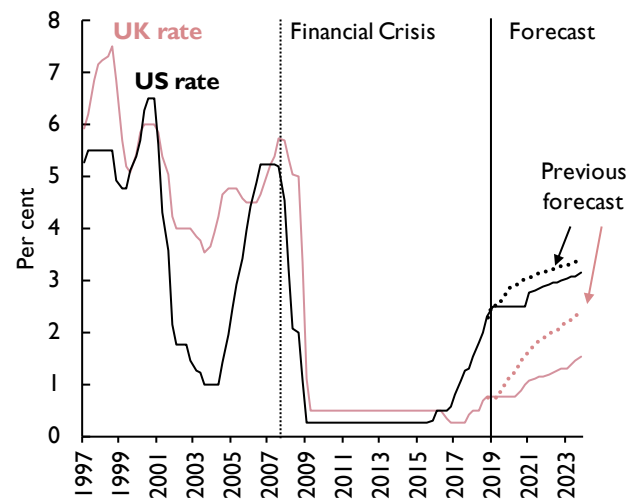
Monetary and fiscal policy recommendations

Our main-case forecast assumes that fiscal policy will be more stimulatory than implied by the Office for Budget Responsibility (OBR)'s projections that accompanied the Spring Statement. This reflects our longstanding view that the government's spending plans to reduce total managed expenditure to below 38 per cent of GDP, as summarised in the OBR's *Economic and Fiscal Outlook*, are not credible when the population is ageing and public sector pay is below the level needed to recruit and retain a skilled workforce. It is possible that a further relaxation of public spending restraint will be announced in the Budget following the Spending Review later this year, over and above what was already announced in last year's Budget and built into the OBR's assumptions. If not, we expect spending to increase over time in response to pressures as they arise.

One of the consequences of Brexit preparations is that much government attention has been diverted from other activities. This means that little has been achieved in other urgent policy areas such as adult social care, where the promised Green Paper has been further delayed, the future of post-18 education, where publication of a review headed by Philip Augar has been expected for some months, or the productivity agenda, where the government's Industrial Strategy has little visibility or direction. Despite the National Infrastructure Commission setting out clear recommendations in its assessment last July, there has been no progress in implementing any of them.

At some stage extra spending will require higher taxation if the government is to meet its fiscal targets. Given the piecemeal way in which the tax system has evolved, we believe that there needs to be a comprehensive review of taxation so that revenue can be raised in a fair and efficient manner. We doubt, however, that this will happen and in our view it is more likely instead that the government's fiscal targets will not be met on a sustainable basis.

Figure 5. Short-term interest rates in the UK compared with US



Source: NIESR, Federal Reserve, Bank of England.

Our assessment of economic developments implies that the Monetary Policy Committee (MPC) should delay the next increase in Bank Rate until the second half of next year. This is later than we had forecast in February and partly reflects higher uncertainty at home, a weaker outlook for global demand and receding inflationary pressure that has also led to a delay in the expected path of monetary policy tightening in the US and the Euro Area (figure 5).

Thereafter, Bank Rate rises at a gradual rate to head off any emerging inflationary pressure. On current trends, with CPI inflation expected to remain around target and output staying close to potential, any increase is likely to be limited and Bank Rate would not reach 1.5 per cent before the end of 2022. At that point the Bank would start to shrink its balance sheet in line with the guidance it provided last June. This path for Bank Rate is of course uncertain and dependent on the outcome of Brexit. The MPC has provided guidance on how the future path of Bank Rate is likely to be affected by different Brexit outcomes. In particular, the MPC will assess the balance of the effects on demand, supply and the exchange rate and set policy rates accordingly. This means that it will balance the trade-off between the speed at which inflation is returned to target and the support that monetary policy provides to jobs and activity (Carney, 2018). In our February *Review* we showed how monetary policy together with fiscal policy could be used to ease the adjustment to a hard Brexit.

Section 2. Forecast in detail

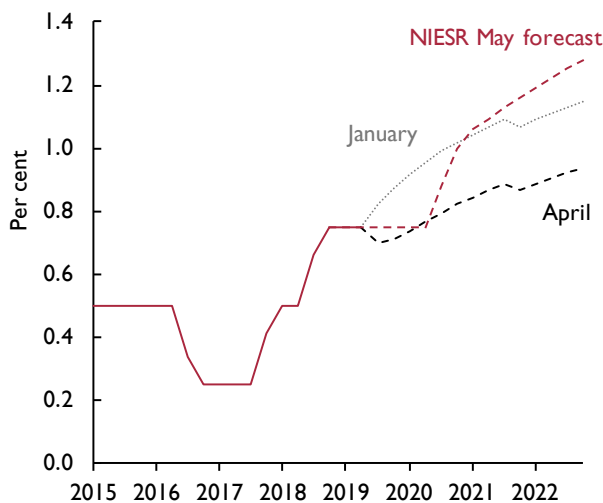
Financial market conditions

Despite the high level of political and economic uncertainty, financial market conditions remain supportive of domestic demand (table A1). In particular, the level of interest rates facing households and businesses is low, the exchange rate has been steady, and equity prices have risen substantially above their December lows.

Markets expect the next increase in Bank Rate to be delayed until sometime in mid-2021 (figure 6). This is some six months later than in our main-case forecast, reflecting the pricing of risks of a more disruptive EU exit than implied by our ‘soft’ Brexit conditioning assumption. As a result of the expected more gradual policy normalisation, yields on 10-year sovereign bonds have fallen by around 20 basis points since the beginning of January, broadly in line with similar yield curve movements observed in the US over the same period.

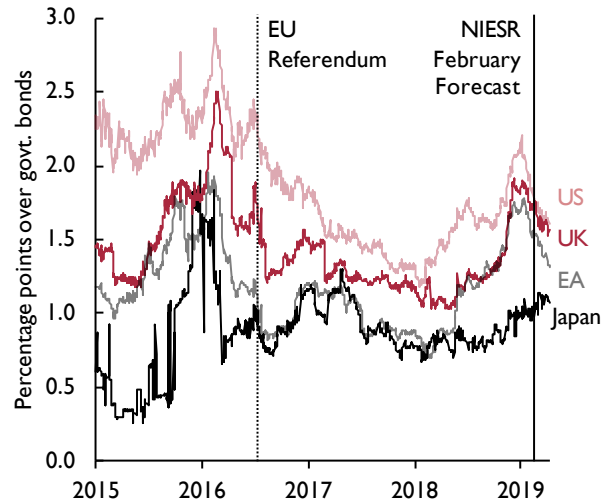
Borrowing costs in the debt capital markets have receded somewhat since the surge in spreads at the end of 2018, similar to other advanced economies (figure 7). The availability of credit to the corporate sector in the fourth quarter of 2018 was unchanged for small and large businesses compared to the previous quarter

Figure 6. Market-implied paths for short-term interest rates and NIESR forecast



Source: Bank of England, NIESR forecast
 Note: The January and April 2019 curves are estimated using instantaneous forward OIS rates in the 15 working days to 4 January and 4 April respectively and are plotted from 3 months onwards.

Figure 7. BBB Corporate bond spread



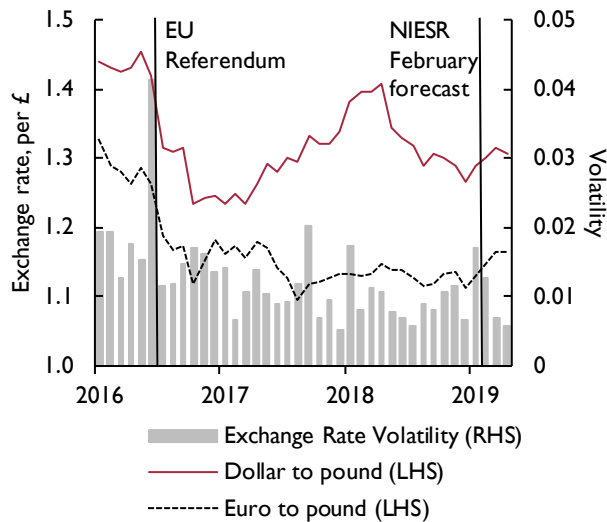
Source: NIESR, Datastream.

but fell slightly for medium-sized businesses surveyed under the Bank of England’s *Credit Conditions Survey*. According to the Agents’ survey, banks’ provision of credit to corporates was gradually tightened at the beginning of the year, in particular lending to the retail and construction sectors and lending to companies exposed to Brexit uncertainty.

The value of sterling has tended to move with expectations concerning Brexit. In particular, sterling has tended to depreciate whenever the risks of a hard Brexit have risen. The level of sterling at the start of this forecast is 2½ per cent higher against the US dollar and 4 per cent higher against the euro compared to our last forecast (figure 8). After a spike at the beginning of the year, sterling volatility has ebbed since. On our main-case forecast, sterling appreciates slightly in the future, reflecting global interest rate differentials. Against the dollar, it rises to \$1.34 by the end of 2020. If the risks of a no-deal Brexit were to abate, we would expect sterling to appreciate to \$1.40.

A more accommodative stance of monetary policy has provided support to equity markets globally (figure 9). Since the beginning of January, the FTSE-All share index has increased by 10 per cent. Similar to 2018 as a whole, UK equity markets tracked markets in Europe but underperformed US markets.

Figure 8. Sterling exchange rate and volatility



Source: NIESR, Datastream.

Note: Volatility is measured as the standard deviation of daily exchange rate movements per month, averaged over \$/£ and €/£ exchange rates.

Figure 9. Equity markets



Source: NIESR, Datastream.

Aggregate demand Output and components of demand

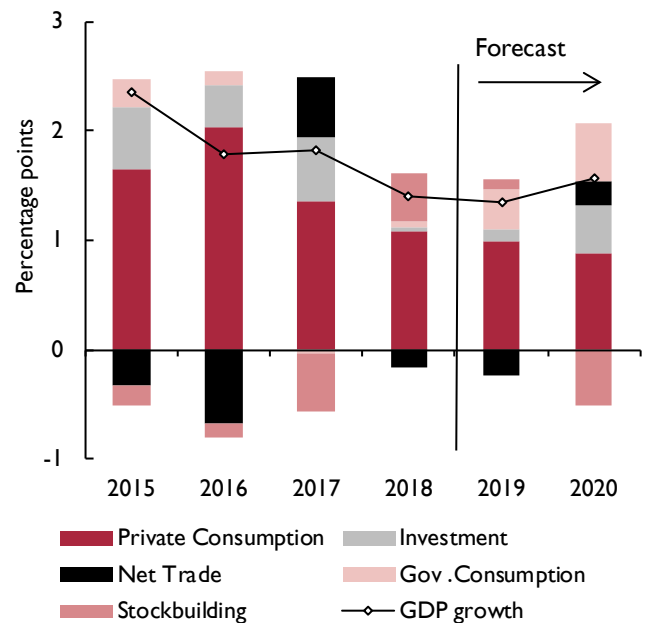
According to the NIESR GDP Tracker, the economy expanded by 0.4 per cent in the first quarter, and is expected to grow by 0.3 per cent in the second quarter. In our main-case forecast the economy will grow by

around 1½ per cent in both 2019 and 2020, broadly the same as the rate achieved in 2018.

Private consumption made the largest contribution to GDP growth in 2018, financed by a substantial fall in household savings (table A3 and figure 10). With the saving ratio at a low level, we expect the consumption contribution to GDP growth to ease gradually from 1.1 percentage points in 2018 to 0.9 percentage points in 2020. Fixed investment growth is expected to remain subdued in 2019 due to prolonged Brexit-related uncertainty, contributing 0.1 percentage points to GDP growth in 2019, after neither adding to growth nor subtracting from it in 2018. Government consumption added only around 0.1 percentage points to GDP growth in 2018 on current ONS estimates. While the Spring Statement did not contain substantial spending promises, our judgement is that government spending will gradually need to grow more than in the recent past to accommodate the needs of an ageing population and maintain the quality of public services (see Public finances section, Chadha *et al.*, 2019). We forecast government consumption to add 0.4 percentage points to real GDP growth in 2019, rising to 0.5 percentage points in 2020.

After moderately rebalancing towards net trade in 2017 as the 2016 depreciation of sterling provided support

Figure 10. Contributions to GDP growth



Source: NIESR.

to exports, import growth outstripped export growth in 2018 with net trade subtracting 0.2 percentage points from GDP growth. Over the course of 2019, we expect exports to recover some of the losses made in 2018. At the end of 2018, imports strengthened which can partly be explained by stockbuilding activity that is expected to continue during the first half of 2019. We forecast net trade to again subtract 0.2 percentage points from GDP growth in 2019 before adding 0.2 percentage points in 2020.

The risk of a no-deal exit from the EU appears to have led to a build-up of inventories of inputs and finished products. Around two fifths of respondents to the Bank of England Agents' survey reported stockbuilding activity in response to Brexit, in particular in manufacturing. This is expected to have supported manufacturing production in the first quarter of 2019. The Manufacturing Purchasing Managers' Index (PMI) rose to a 13-month high of 55.1 in March; the index's sub-component reflecting stocks of factory purchases rose to 66.2, the highest reading ever recorded in any G7 economy since IHS Markit started collecting data in 1992.

Stockbuilding adds to GDP but the official data also contains a substantial alignment adjustment that obscures the underlying inventory picture. The main-case forecast incorporates a substantial turnaround in stockbuilding in late 2019 and early 2020. Important for the future profile of GDP growth is whether stockbuilding bolsters mainly domestic production or imports. Depleting stocks once the risk of no deal wears off would in the former case weigh down on GDP growth. If in the second case depleting stocks lowered the demand for imports, there would be no effect on GDP growth. The rise in manufacturing activity accompanied by a pick-up in imports suggests both factors observed are playing a role and are likely to offset each other. Stockbuilding added 0.4 percentage points to GDP growth in 2018 and is expected to add 0.1 percentage points in 2019, before subtracting 0.5 percentage points in 2020 as stocks are depleted (figure 10).

External sector: support from abroad softens

Recent trade data show that goods imports from EU countries increased by 4.2 per cent in the three months to February compared with the previous three months, the largest increase since December 2016, driven mainly by machinery and car imports; goods imports from the rest of the world increased by 3.6 per cent. Goods exports to the EU picked up by 3.4 per cent over the same period but collapsed by 6.5 per cent with the rest

of the world. The overall trade deficit of the UK widened by £5.5 billion in the three months to February, driven by a widening of £6.5 billion of the goods trade deficit and only partly offset by a widening of £0.9 billion of the services trade surplus.

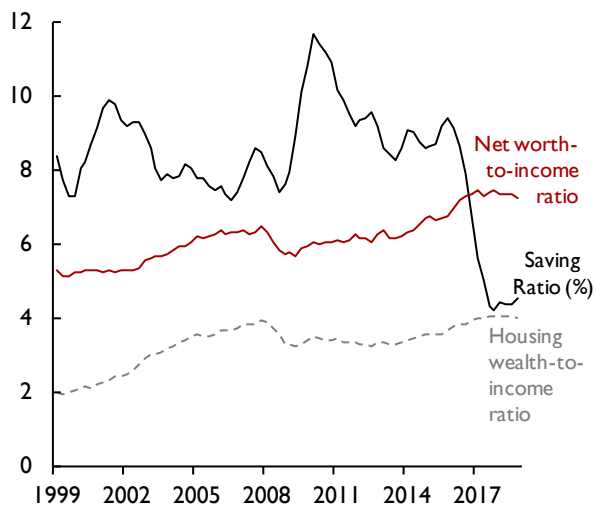
Looking ahead, the global trading environment is precarious as a result of continued trade tensions between the US and China, the threat of tariffs and non-tariff barriers as well as Brexit uncertainty (for more detail see the World Economy chapter). In the aftermath of the referendum, strengthening global growth, in particular in the Euro Area, provided support to the UK economy at a time when confidence weakened. In our February 2018 *Review* we estimated that some 0.6 percentage points of the whole-economy growth rate of 1.7 per cent in 2017 could be explained by stronger global growth than expected a year before. Exports rose by 5.6 per cent that year supported by weaker export prices due to the currency depreciation. The weaker global outlook suggests that similar support is unlikely to be provided to the UK economy in 2019, in particular in the event of a no-deal Brexit. Based on our 'soft' Brexit assumptions, our main-case forecast is for export growth of 2½ per cent in 2019, after remaining nearly flat in 2018, further increasing to around 3½ per cent in 2020 (table A4). On our forecast, import growth is supported by stockbuilding activity in the first half of 2019 and reaches just above 3 per cent in the year as a whole and 2½ per cent in 2020.

Households: consumption and wealth

Consumption held up relatively robustly in the wake of the EU referendum in spite of subdued growth in income. Annual consumption growth eased from 3.1 per cent in 2016 to an estimated 1.8 per cent in 2018, as the depreciation of sterling and higher inflation put pressure on real disposable incomes (table A5). Real disposable income was flat in 2016 and 2017, before increasing by 2.1 per cent in 2018. Higher spending growth was financed by a fall in the household saving ratio. The saving ratio dropped from more than 9 per cent in 2015 to around 4 per cent in both 2017 and 2018, the lowest since the 1960s, when this data became available on a quarterly basis (figure 11).

Lower saving out of income has been facilitated by higher borrowing, encouraged by low interest rates. Over the past five years, consumer debt (excluding credit card and student loan debt) rose by around 30 per cent in real terms. The lower saving ratio is also likely to have been driven by asset price appreciation that meant that household wealth rose independently of saving out of income. Household wealth increased by

Figure 11. Household saving and wealth



Source: NIESR.

Note: Moving annual average of the saving ratio.

around 20 per cent during the past five years, mainly as a result of house price growth. Figure 11 illustrates that household saving and wealth-to-income ratios tend to move in opposite directions, abstracting from more volatile movements of the saving ratio which is also prone to data revisions. For instance, during the 2008–9 recession, the net-worth-to-income ratio fell as house prices collapsed and, at the same time, the saving ratio surged. The contrary movement appears to have taken place over the past five years. The slowdown in house price growth since the referendum and stabilisation of net worth limit the extent to which consumption can continue increasing and consequently contribute to a stabilisation of the saving ratio.

Against the backdrop of slower house price growth, stabilising wage and employment growth and Brexit uncertainty, consumer confidence measured by GfK has stabilised at significantly negative levels in the first quarter of 2019 while real-time data provided by Visa shows that consumer expenditure has fallen in each of the five months to February.²

Looking forward, we expect consumption growth of around 1½ per cent in both 2019 and 2020. This is slower than the forecast growth of real disposable income of over 2 per cent in both years. Real income growth is being driven by higher income per head and by continued growth in employment. According to our Wage Tracker, average weekly earnings were growing

at an annual rate of around 3½ per cent in the first quarter of 2019, consistent with annual real pay growth of 1½ per cent. The increase has been driven by firmer wage dynamics in both the private and public sector at high levels of employment. Further upward pressure on wages is expected from increases in the National Living Wage. This increased to £8.21 an hour in April, an increase of 5 per cent, and is expected to reach two-thirds of median earnings next year.

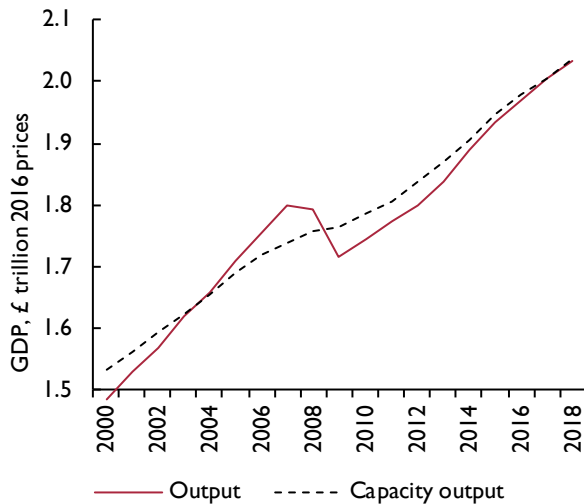
Our forecasts for consumption and real disposable income are consistent with a gradual rise in the saving ratio back towards more normal levels.

Investment under chronic uncertainty

Business investment contracted in each of the four quarters of 2018. Box C discusses different explanations for this slowdown. Haskel (2019) estimates that 70 per cent of the slowdown in investment growth since the EU referendum is due to Brexit. It is important to note that the result of the referendum is likely to have affected investment decisions in two distinct ways which are difficult to disentangle: 1) uncertainty about the UK's future trading relationship with the EU, 2) a change in expectations about future trade to the extent that trade affects profitability. All else equal, higher uncertainty makes firms delay investment decisions, which are generally hard to reverse, until the source of uncertainty is eliminated. Investment projects may be cancelled or diverted to other countries permanently if firms expect profitability to be lower in the future, as would be the case in the presence of trade barriers. With Brexit uncertainty turning from a temporary phenomenon into a more chronic obstacle to long-term economic planning, we would expect investment projects that yield profits in the near term to go ahead without further delay. Even if trade between the UK and the EU continues to take place without major frictions, i.e. consistent with our central forecasting assumption, we now expect investment growth not to fully bounce back as a result of the long-term lack of clarity. Partly due to the weakness in 2018, business investment is expected to contract by around 1 per cent in 2019, before expanding by 2 per cent in 2020 (table A6).

The corporate profit share is forecast to fall through 2019 as high unit labour costs growth is partly offset by lower margins (table A6). Nevertheless, the profitability of the UK private sector remains strong and it is estimated that the overall rate of return on capital exceeds the user cost of capital. This suggests that the conditions for investment in the UK economy would be promising apart from the likely continuation of uncertainty related to the EU-withdrawal process.

Figure 12. Output and capacity output



Source: NIESR.

Supply conditions

For some time now it has appeared that there is little, if any, slack remaining in the economy. This means that economic growth will need to come from an expansion in supply potential, determined by the availability of labour, capital and the efficiency with which they are used in production (figure 12). The overall pattern in recent years has been for employment to rise relative to capital which has been associated with lacklustre productivity growth. This is set to continue in the near term, limiting potential output growth to around 1½ per cent per year in the short term.

As far as capital is concerned, the net capital stock is estimated to have grown by 1.3 per cent in 2018. Our forecast of weak investment implies that capital stock growth will continue at around 1½ per cent per year.

The labour market: reaching its limit

The UK labour market is tight, with unemployment at 3.9 per cent in the three months to February, the lowest rate since 1974. We doubt that there is scope for unemployment to fall much further, but we are expecting some increases in labour supply due to a continuing rise in labour force participation and further inward migration (table A7).

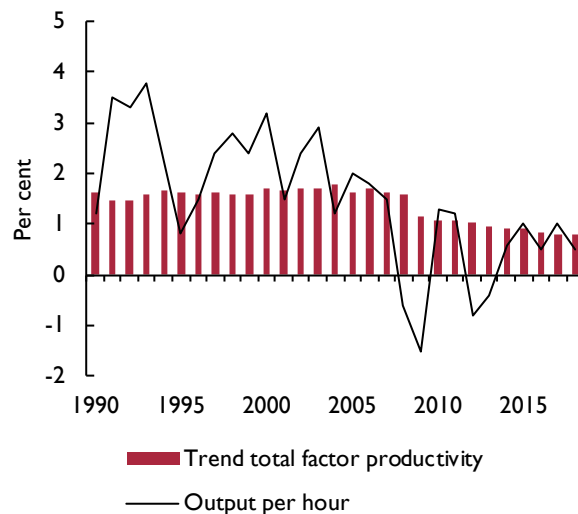
Labour force participation reached 79 per cent in the fourth quarter of 2018, the highest since records began in 1970 and 1 percentage point higher than the previous peak reached in 1990. There is scope for participation to increase further, particularly among working age men (where the participation rate is more than 10 percentage

points lower than it was in 1970) and people over retirement age.

Net migration has continued to add to the size of the population. In the year to September 2018, 283,000 more people moved to the UK permanently than left over the same period. This was mainly driven by net migration from outside the EU which has continuously increased to reach 261,000 per year in the most recent data. It partly offset the reduction in net migration from EU countries which fell to 57,000 from a peak of 189,000 per year prior to the EU referendum. A third of the reduction in EU net migration can be explained by emigration, two-thirds by lower levels of immigration. As long as employers are able to recruit people with similar skills from outside of the EU as from within, we would expect the impact of changes in net migration patterns to have a neutral effect on productivity. Yet hiring from outside of the EU's single market, and in the absence of European freedom of movement depending on final arrangements between the UK and the EU, is likely to be more difficult, raising the cost of production.

Evidence from surveys is mounting that Brexit uncertainty has started to weigh on hiring at the beginning of 2019. KPMG and the Recruitment and Employment Confederation report that permanent staff appointments in March fell at the quickest rate since July 2016 and vacancy growth softened to the slowest pace since August 2016, albeit from strong rates of growth previously.³

Figure 13. Productivity growth



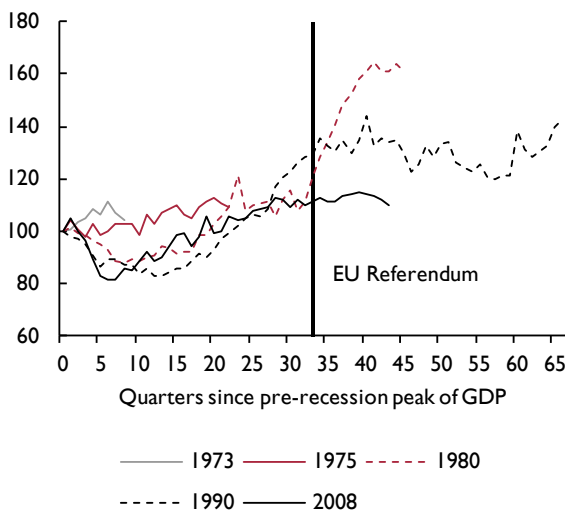
Source: NIESR, ONS.

Box C. The disappointing picture of business investment

Business investment in the UK is estimated to have fallen for each of the four quarters of 2018 and recent surveys of business leaders indicate that there is no rebound on the horizon. Sustained low investment constitutes a major area of concern for the UK economy, with consequences for living standards in the longer term. In this box we review the latest data and discuss what has made the United Kingdom a less attractive place to invest in the midst of Brexit uncertainty. A key question is whether investment would recover should there be more clarity about the UK's future trading relationship with the rest of the world.

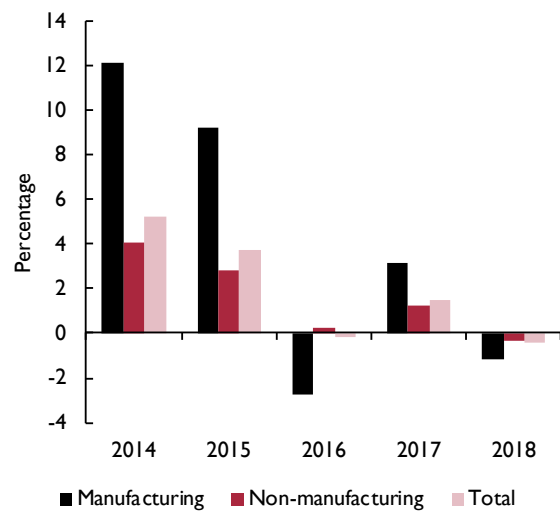
Relative to the past four recessions, this expansion phase has been prolonged. As figure C1 shows, it is only in the past 2½ years that the level of investment has clearly disappointed relative to previous expansions, corresponding to about the same date as the EU Referendum. The level of business investment in the last quarter of 2018 was about 13% less than an extrapolation of the 2010–16 trend would have predicted. The UK picture also compares unfavourably to other advanced economies as the UK is the only G7 country where business investment is estimated to be declining. Even in the rather favourable modal scenario of a soft Brexit where the UK retains a very close trade relationship with the EU, we expect no rebound and instead forecast business investment to contract by 1.1 per cent in 2019.

Figure C1. Business investment after previous recessions (pre-recession peak=100)



Source: ONS and NIESR calculations.

Figure C2. Annual growth in business investment (UK)



Source: ONS and NIESR calculations.

The slowdown in business investment since 2016 has been apparent in both manufacturing and non-manufacturing sectors (figure C2). Manufacturing investment has been growing strongly ahead of the referendum before contracting in 2016, recovering slightly in 2017, and contracting again in 2018. There was a brief rebound in business investment in 2017, but this rebound proved short-lived, in both manufacturing and non-manufacturing sectors.

To what extent has Brexit dampened investment in the UK? Brexit affects business investment in two ways. First the uncertainty related to the future trading arrangement between the UK and the EU-27 causes business leaders to delay or forego investments until they feel more confident about how the new arrangement will affect the profitability of their investments. According to the Deloitte CFO survey (2019), 58% of Chief Financial Officers consider that the current level of uncertainty affecting their businesses is either high or very high, which is the highest reading since the summer of 2016. Bloom *et al.* (2018) estimated that the increase in uncertainty led to investment being 6% lower than otherwise predicted. Faced with the risk that a disorderly Brexit might create disruptions to their businesses, business leaders are currently more focussed on stockpiling than investing in the future.

Second, even when businesses know for sure what the new trading arrangements will be once the UK is out of the EU, they may still wish to reduce their investment because the additional trade frictions could warrant a lower equilibrium level of investment. The Bank of England Decision Maker Panel Survey (DMP, 2018) confirms that more businesses expected to reduce their investment than to increase it directly as a result of Brexit. In a survey between November 2017 and January 2018, about 30%

Box C (continued)

of business leaders expected changes in customs and tariffs and in the freedom of movement of people to lead to lower investment, and only 10% expect Brexit to lead to higher investment (figure C3). NIESR estimates that in the case of a no-deal exit from the EU, business investment would be reduced by 3.5% in the long run compared to continued membership in the EU because of reduced international competition and lower foreign direct investment (Hantzsche *et al.*, 2019). It is important to note that while only businesses trading with the EU are expected to be directly impacted by Brexit, other businesses will also be impacted by second round effects as a result of changes in the exchange rate, inflation, financing conditions and consumption.

The loss in attractiveness of the UK economy as an environment for investment has been reflected in lower-than-expected foreign direct investment (FDI). Serwicka and Tamberi (2018) estimated that since the EU referendum, UK inflows of FDI have been reduced by between 16 and 20 per cent. They found that the service sector was particularly hit, with a reduction in FDI of about 25 per cent. Conversely, Breinlich *et al.* (2019) estimated that the number of new investments made by UK firms in European Union (EU) countries since the EU referendum was 12% higher than

it would otherwise have been expected to be. Overall, these two effects suggest that there may have been some diversion of investment from the UK to other European countries as a result of the loss of attractiveness of the UK as a base for international business. We should however take those results with a degree of caution because while the UK's share of FDI in Europe has been reduced, the UK is still one of the largest recipients of FDI in the World, and FDI flows are very volatile from one year to the next.

While the Brexit vote is widely cited as a primary factor behind relatively low investment (NIESR/SPE, 2019), other long-term factors like the labour market and productivity may also help explain the disappointing investment figures. An expanding labour market (unemployment at record low and employment at record high) along with unit labour costs growing very moderately has meant that businesses have invested relatively more in labour than in fixed capital. But this argument does not explain the relative weakness of UK business investment compared to other advanced economies that are broadly in the same business cycle position and with similar employment situations. Another argument is that weak investment growth may be related to the productivity puzzle. UK productivity growth in the past ten years has lagged behind all other advanced economies except Italy. If businesses doubt that additional investment can lift their productivity, then it could explain why they have limited their investments.

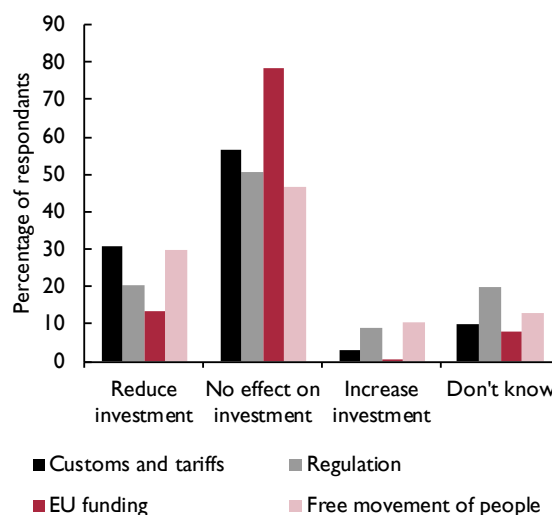
The combination of Brexit uncertainty and lagging productivity performance appears to have made investing in the UK less appealing. The more worrying feature would be that, if the low business investment trend were to continue, it could impair future economic growth prospects.

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This box was prepared by Cyrille Lenoel.

Figure C3. Expected impact of Brexit on investment due to potential changes



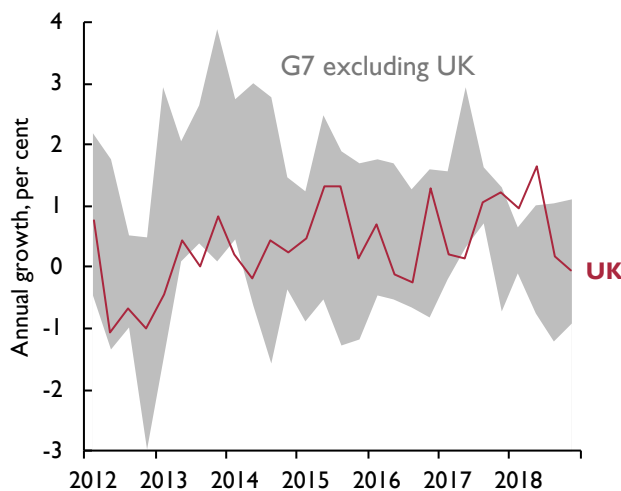
Source: Bank of England Decision Maker Panel (Nov. 2017–Jan. 2018).

Productivity puzzles

Labour productivity measured as output per hour worked is estimated to have contracted in the last two quarters of 2018 bringing the annual growth rate for that year to 0.5 per cent, in line with the post-crisis average (table A7). Labour productivity growth is ultimately driven by total factor productivity (TFP) growth. Figure 13 plots updated estimates of the trend growth rate of TFP which we obtain by applying filtering techniques to a measure of TFP that results from a decomposition of real gross value added growth (Thamotheram, 2017). These estimates confirm the absence of a recovery of productivity growth. Our central case is for this broad pattern to continue. Productivity per hour is forecast to grow by $\frac{3}{4}$ per cent in 2019 and $1\frac{1}{4}$ per cent in 2020.

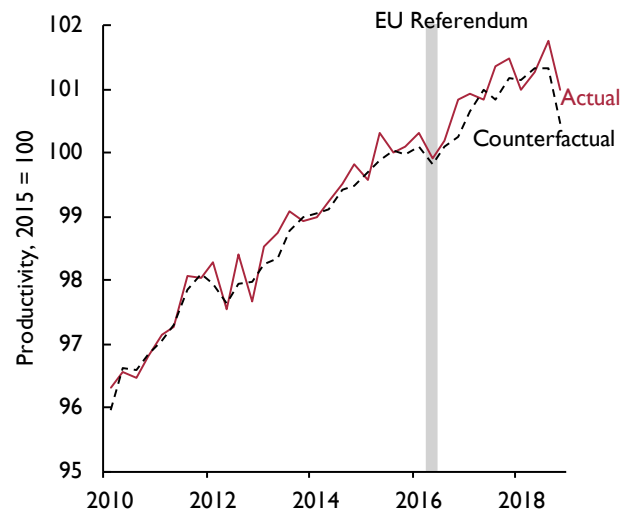
It is, of course, impossible to know how UK productivity would have evolved if the EU referendum had not taken place. But it is possible to form an estimate by looking at how it has changed relative to other countries. Figure 14 plots the quarterly growth rate of labour productivity in the UK and other G7 economies. It suggests that the weakness of UK productivity growth relative to other countries has not worsened since the EU referendum. To test this more formally, we construct a counterfactual path for labour productivity using synthetic control methods (see Born *et al.*, 2019, for an application to UK GDP). To do so, we calculate the weighted average of productivity in countries not directly affected by the Brexit referendum, where weights are determined to minimise the difference between this counterfactual and

Figure 14. Labour productivity, UK vs G7



Source: NIESR.

Figure 15. Labour productivity, actual vs no-Brexit counterfactual



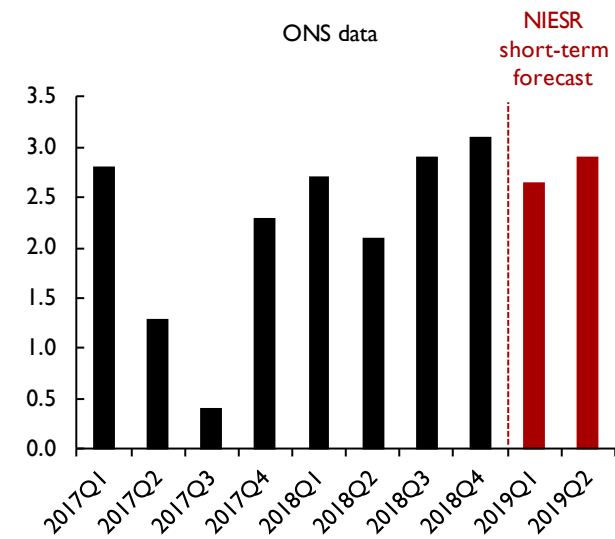
Source: NIESR, OECD.

actual UK productivity data prior to the second quarter of 2016. Figure 15 shows that counterfactual productivity tracks actual productivity very closely. The counterfactual puts most weight on productivity data from Canada, New Zealand and Japan, i.e. countries that are plausibly not very much affected by the referendum result. The figure shows further that counterfactual productivity continues to track actual productivity quite closely during the post-referendum period. This suggests that, so far, Brexit uncertainty has not yet had sizeable distinctive effects on productivity developments in the UK. While there is not strong evidence that UK productivity growth has deteriorated as a result of Brexit-related uncertainty, the effects we have seen on investment pose a risk to productivity growth in the future.

Price pressures robust but stabilising

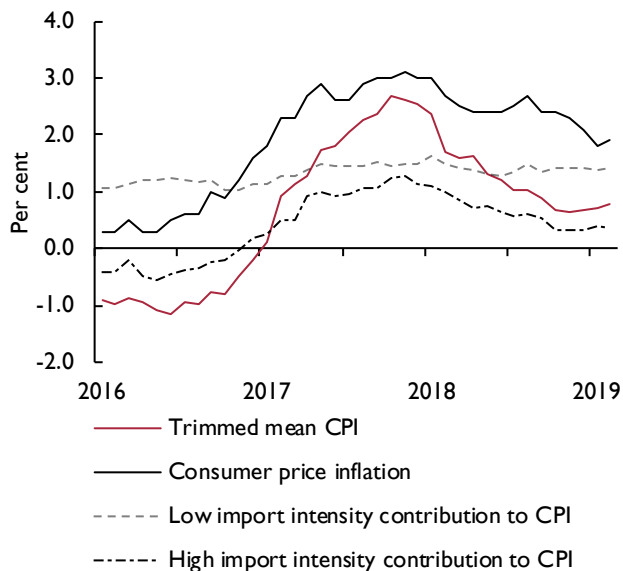
Upward pressure on wages associated with a tightening labour market, together with lacklustre productivity growth, has translated into increasing cost pressure (table A2). With labour costs per hour increasing by 2.9 per cent in the final quarter of 2018 and output per hour decreasing by 0.1 per cent, unit labour costs have increased by 3.1 per cent on ONS estimates. Based on output growth information from our monthly GDP Tracker, the earnings growth forecast from our Wage Tracker and forecasts of employment growth and non-wage labour costs, we expect annual unit labour cost growth to ease somewhat to 2.9 per cent in the second quarter of 2019 (figure 16). With wage and employment growth stabilising, we expect similar rates of labour cost growth for the rest of the year.

Figure 16. Unit labour costs (annual growth rate)



Source: ONS, NIESR.

Figure 17. Measures of consumer price inflation



Source: ONS, NIESR.

Robust but stabilising domestic cost pressures are also reflected in prices on goods and services with low import content which have firmed somewhat during the second half of 2018 (figure 17). At the same time, price inflation of high-import content goods and services softened, partly as a result of the fall in oil prices towards the end of 2018. Since the beginning of the year, the price of

Brent crude oil in sterling has increased by 30 per cent which may put additional pressure on costs and prices in the near term. Our trimmed mean measure of consumer price inflation, which excludes the highest and lowest 5 per cent of price changes, has also stabilised below 1 per cent (see NIESR press note on CPI inflation statistics). Overall, consumer price inflation has stabilised at just below 2 per cent in the first three months of 2019. Based on the assumption of a soft Brexit accompanied by prolonged political uncertainty, we expect inflation to remain around 2 per cent over the forecast horizon.

Public finances: robust headline figures conceal pressures ahead

Recent developments

Public sector borrowing has turned out to be smaller than expected in the fiscal year ending in March 2019 (table A8). Public sector net borrowing reached £23 billion between April 2018 and February 2019, compared to £41 billion over the same period a year earlier. The Office for Budget Responsibility (OBR) now expects borrowing to remain at this level for the whole of 2018–19, or 1.1 per cent of GDP, a downward revision of around £3 billion compared to its October 2018 forecast. It expects the primary budget, i.e. the budget net of interest payments, to have been in surplus in 2018–19 and to have reached 0.3 per cent of GDP. Public sector net debt stood at 82.8 per cent of GDP in February 2019, a decrease of 1.4 percentage points compared to a year earlier.

The unexpected pace of improvement in the public finances can firstly be explained by more favourable employment and average earnings outcomes. In March 2018, the OBR expected employment to reach 32.2 million in 2018, compared to an estimated outturn of 32.4 million; average earnings growth was estimated at 2.7 per cent that time but reached an estimated 3 per cent in 2018. This bolstered tax revenue and lowered welfare payments. Second, debt interest payments were forecast to be £43.2 billion in 2018 while the estimated outturn is £4.8 billion lower. This is because RPI inflation, and thus interest paid on inflation-indexed bonds, was lower than expected and because of a flattening of the yield curve as markets are now pricing a more accommodative monetary policy stance.

Brexit uncertainty may also have contributed to improved public finances outcomes in several ways. First, while the government allocated additional funds to no-deal planning, the occupation of government with Brexit planning is likely to have delayed other spending projects. The Chancellor is yet to announce the 2019 Spending

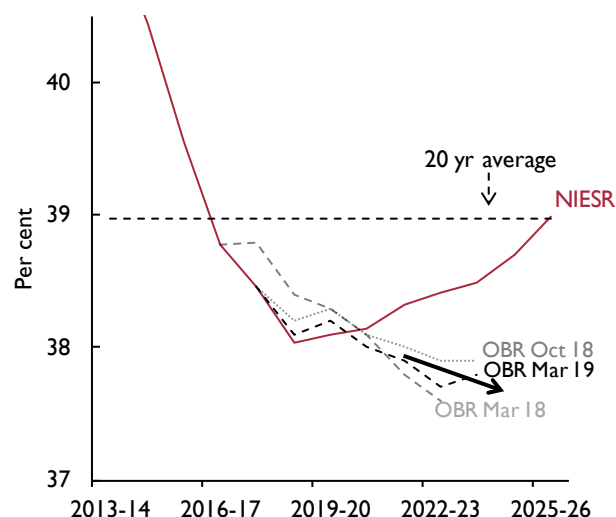
Review covering spending decisions at least until 2022–23. Second, the possibility of a no-deal Brexit has meant that financial markets have been pricing a potential reaction by the Bank of England, providing the government with lower long-term borrowing costs than otherwise (see also Chadha *et al.*, 2018). Third, to the extent that Brexit uncertainty has led to a reallocation from capital to labour, supporting employment growth, the government may have benefited somewhat from higher tax receipts than otherwise. No-deal preparations, on the other hand, have meant that the government has spent resources on contingency measures that would not be required under a softer Brexit outcome, amounting to an estimated £1.5 billion by March 2019 (National Audit Office, 2019).

Since our last forecast, the government has not made sizeable spending commitments. The Spring Statement in March 2019 was not treated as a full fiscal event by the government and the size of announced policy measures remained small. The OBR estimates that the net cost of policies announced since the 2018 Autumn Budget, mainly additional spending on public services, amounts to £2.1 billion by 2023–24.

Public finances forecast and risks

Our public finances forecast continues to be based on the assumption that public spending as a share of GDP will in the medium run be at or above its historical average. This is because an ageing population will require higher health and care spending while funds

Figure 19. Assumptions about total managed expenditure as a share of GDP



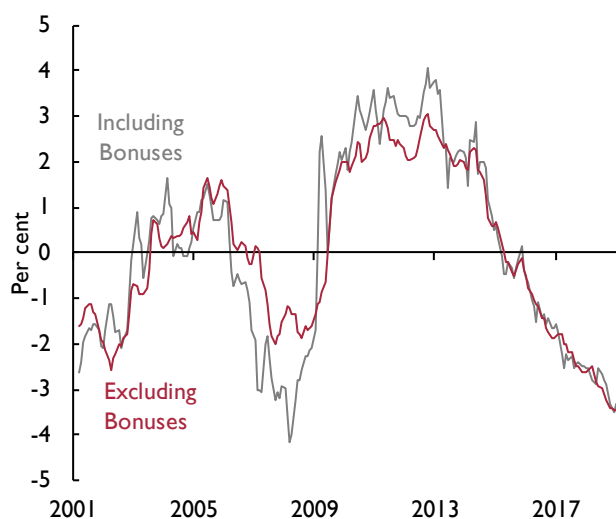
Source: OBR, NIESR.

are needed to maintain the quality of public services in addition to current government commitments (Hantzsche and Young, 2018). This will also require additional increases in public sector pay. We estimate that public sector wages were 3½ per cent below their long-run trend level at the beginning of 2019 and in the past have returned to trend within 2–3 years following similar deviations (figure 18). With a public sector paybill of around £180 billion, closing the public-private sector wage gap would cost around £6 billion per annum, or a quarter of a percentage point of GDP.

We assume that total managed expenditure increases as a share of GDP from 2019–20 onwards to reach its long-run average of around 39 per cent. Figure 19 shows that the government’s plans are for the expenditure share of GDP to fall below 38 per cent. While in the last two years spending outturns were lower than initially expected, the OBR revised spending as a share of GDP up in its recent forecasts in response to new government policies, similar to what we anticipate.

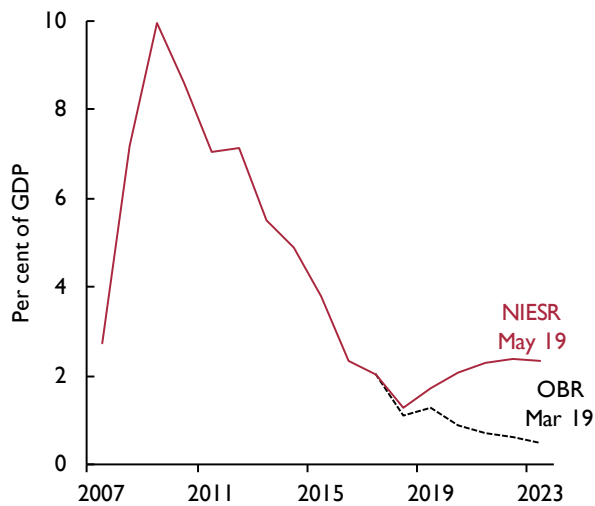
As a result of higher public spending in our forecast as well as a less optimistic outlook for public sector current receipts compared to that of the OBR, we expect public sector net borrowing to stabilise at just above 2 per cent of GDP by 2023–24, compared to the OBR forecast which projects it to fall to 0.5 per cent. This would be in breach of the government’s current fiscal objective of achieving overall fiscal balance by the middle of the next decade. As a consequence of higher deficits, public

Figure 18. Public-private sector wage gap



Source: NIESR.
Note: Estimates based on Dolton *et al.* (2018).

Figure 20. Public sector net borrowing



Source: OBR, NIESR.

sector net debt decreases more slowly than on the OBR's forecast, reaching 77 per cent of GDP by 2023–24.

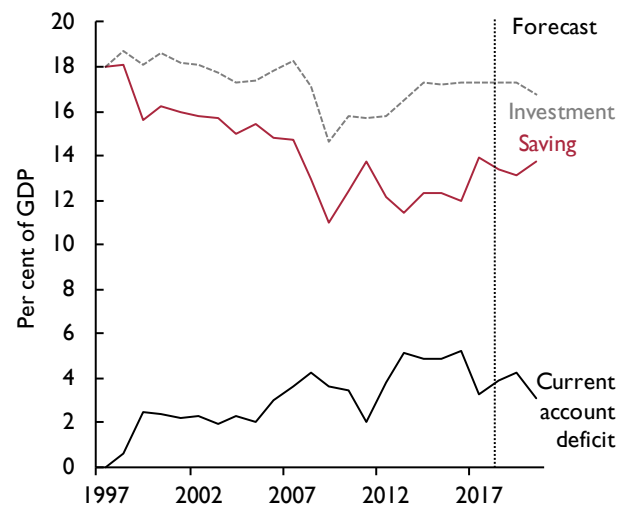
We will revise our borrowing forecast once more clarity is provided by the ONS on the future treatment of student loans in the National Accounts. Given that only around 30 per cent of student loans are being repaid in full, they will no longer be treated entirely as loans provided by the government. Instead the ONS will treat part of loan outlays as capital grants directly affecting headline borrowing figures. The OBR (2019) estimates that the new methodology would by 2023–24 add £13.7 billion to public sector net borrowing, corresponding to 0.5 per cent of GDP.

While our public finances forecast deviates from the government's stated plans it is broadly based on the current fiscal policy regime. A change of government therefore poses a risk to our forecast. Another risk to our forecast is a no-deal Brexit. Our February 2019 *Review* discussed fiscal policy options to mitigate the short-run economic impact (Hantzsche and Kara, 2019) and found that the government could be required to increase borrowing by 2 per cent of GDP to support household incomes.

Sectoral balance: triple deficit

Table A9 shows the saving and investment balances of the household, corporate and public sectors of the economy and the resulting balance with the rest of the world. If investment is greater than saving for a sector, then that

Figure 21. Aggregate saving, investment and current account deficit



Source: ONS, NIESR.

sector is a net borrower. The aggregation of these three domestic sectors is the current account balance, which, if in deficit, implies that borrowing from the rest of the world is required in order to fund domestic investment plans. It is not possible to infer the optimality of the levels of capital from the current account but rather just the immediate financing needs of the economy.

In 2018, all three domestic sectors of the economy – households, companies and government – were in deficit for the second year in succession, reflecting the low level of saving in the UK economy. This is unusual historically; it is more normal for the household sector to save more than it invests and help finance the deficits of the corporate and government sectors.

The unusually large household sector deficit reflects both low saving and relatively high housing investment. Household investment rose steadily from a trough of 3.2 per cent of GDP in 2009 to 4.3 per cent of GDP in 2017, which is similar to the pre-crisis high of 4.5 per cent in 2006–7. With demand for housing still growing strongly, we project household investment to increase in each subsequent year and to settle at 4½ per cent of GDP under our soft Brexit scenario. Gradually rising levels of household saving from 2019 will mean that the financial deficit is reduced over time and will move into a more typical surplus position around 2021.

On the corporate side, saving has been supported by robust profits, offset by higher dividend distributions,

some of which impact directly on the balance of payments as they are paid overseas. We forecast corporate saving to GDP to remain close to 9 per cent in the medium term as the headwinds from Brexit ease in our soft Brexit scenario. With corporate investment forecast to settle at a little under 10 per cent of GDP in the medium term, the corporate sector will require about 1 per cent of GDP of net financing from the rest of the economy over the same time horizon.

Government sector saving is expected to fall from a recent peak of 1½ per cent of GDP in 2018 to around ½ per cent of GDP in the medium term as austerity is eased. With government investment running at around 2½ per cent of GDP we expect the government to remain in a net borrowing position of over 2 per cent of GDP beyond 2020.

The current account deficit is forecast to fall from a peak of 4.2 per cent of GDP in 2019 towards 2 per cent of GDP by 2023, reflecting higher saving in the household sector. This deficit is currently high compared with most other G7 economies or the Euro Area and is a reflection of lower saving in the UK than elsewhere. Despite the succession of current account deficits in the UK over the past twenty years, the net international investment position is estimated to be in broad balance at an estimated net liability position of £143 billion at the end of 2018 (around 7 per cent of GDP).

NOTES

- 1 See Baker *et al.*, (2016)
- 2 GfK Consumer Insights, March 2019; Visa UK Consumer Spending Index, February 2019.
- 3 KPMG and REC, UK Report on Jobs, April 2019.

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Appendix – Forecast details

Table A1. Exchange rates and interest rates

	UK exchange rates			FTSE All-share index	Interest rates			
	Effective 2011 = 100	Dollar	Euro		3-month rates	10-year gilts	World ^(a)	Bank Rate ^(b)
2013	102.6	1.56	1.18	3426	0.50	2.40	0.90	0.50
2014	110.2	1.65	1.24	3575	0.50	2.50	0.90	0.50
2015	116.3	1.53	1.38	3590	0.60	1.80	0.90	0.50
2016	104.7	1.35	1.22	3536	0.50	1.30	0.90	0.25
2017	99.2	1.29	1.14	4037	0.40	1.20	1.30	0.41
2018	101.3	1.34	1.13	4048	0.70	1.40	2.00	0.75
2019	103.2	1.31	1.17	3991	0.90	1.20	2.40	0.75
2020	103.8	1.33	1.17	4056	1.00	1.60	2.30	1.00
2021	104.0	1.35	1.16	4101	1.30	2.00	2.30	1.16
2022	104.3	1.37	1.15	4189	1.40	2.30	2.30	1.28
2023	104.6	1.39	1.14	4270	1.60	2.70	2.40	1.53
2018 Q1	101.9	1.39	1.13	4049	0.60	1.50	1.70	0.50
2018 Q2	102.2	1.36	1.14	4153	0.70	1.40	1.80	0.50
2018 Q3	100.5	1.30	1.12	4158	0.80	1.40	2.00	0.66
2018 Q4	100.6	1.29	1.13	3832	0.90	1.40	2.50	0.75
2019 Q1	101.9	1.30	1.15	3872	0.90	1.20	2.40	0.75
2019 Q2	103.6	1.31	1.17	4024	0.80	1.00	2.40	0.75
2019 Q3	103.6	1.31	1.17	4026	0.90	1.10	2.40	0.75
2019 Q4	103.6	1.31	1.17	4045	0.90	1.30	2.40	0.75
2020 Q1	103.7	1.32	1.17	4057	0.90	1.40	2.30	0.75
2020 Q2	103.7	1.32	1.17	4053	0.90	1.50	2.30	0.75
2020 Q3	103.8	1.33	1.17	4053	1.10	1.60	2.20	0.88
2020 Q4	103.9	1.34	1.16	4063	1.20	1.70	2.20	1.00
<i>Percentage changes</i>								
2013/2012	-1.5	-1.3	-4.5	14.8				
2014/2013	7.4	5.3	5.4	4.3				
2015/2014	5.6	-7.2	11.1	0.4				
2016/2015	-10.0	-11.4	-11.2	-1.5				
2017/2016	-5.3	-4.9	-6.7	14.2				
2018/2017	2.1	3.6	-1.1	0.3				
2019/2018	1.8	-1.9	3.1	-1.4				
2020/2019	0.6	1.3	0.1	1.6				
2021/2020	0.2	1.6	-0.8	1.1				
2022/2021	0.3	1.7	-0.9	2.2				
2023/2022	0.3	1.7	-0.9	1.9				
2018Q4/2017Q4	0.7	-3.1	-0.1	-6.7				
2019Q4/2018Q4	2.9	2.1	4.0	5.6				
2020Q4/2019Q4	0.3	1.7	-0.8	0.4				

Notes: We assume that bilateral exchange rates for the first quarter of this year are the average of information available to 3 April 2019. We then assume that bilateral rates remain constant for the following two quarters before moving in line with the path implied by the backward-looking uncovered interest rate parity condition based on interest rate differentials relative to the US. (a) Weighted average of central bank intervention rates in OECD economies. (b) End of period.

Table A2. Price indices

2016=100

	Unit labour costs	Imports deflator	Exports deflator	World oil price (\$) ^(a)	Consump- tion deflator	GDP deflator (market prices)	Retail price index	Consumer prices index
2013	98.0	106.4	101.5	107.8	96.2	95.9	95.1	97.9
2014	97.3	102.0	98.6	98.4	98.1	97.6	97.3	99.3
2015	98.1	96.1	94.3	52.1	98.6	98.0	98.3	99.4
2016	100.0	100.0	100.0	42.9	100.0	100.0	100.0	100.0
2017	102.3	105.5	105.0	54.0	102.1	102.2	103.6	102.7
2018	105.2	108.5	107.8	70.4	104.4	104.1	107.0	105.2
2019	107.8	110.1	109.5	67.4	106.5	106.5	110.3	107.2
2020	110.3	110.9	111.2	66.6	108.6	109.3	114.1	109.3
2021	112.8	112.4	113.0	67.5	110.7	111.9	118.5	111.5
2022	115.2	114.2	114.9	68.8	112.9	114.5	122.5	113.6
2023	117.6	116.1	117.0	70.2	115.2	117.0	126.4	115.9
<i>Percentage changes</i>								
2013/2012	1.9	1.0	2.2	-3.0	2.3	1.9	3.0	2.6
2014/2013	-0.7	-4.1	-2.8	-8.7	1.9	1.7	2.4	1.4
2015/2014	0.8	-5.8	-4.4	-47.0	0.5	0.4	1.0	0.1
2016/2015	1.9	4.1	6.0	-17.7	1.4	2.1	1.7	0.7
2017/2016	2.3	5.5	5.0	25.8	2.1	2.2	3.6	2.7
2018/2017	2.8	2.9	2.6	30.5	2.3	1.9	3.3	2.4
2019/2018	2.5	1.5	1.6	-4.4	2.0	2.3	3.0	1.8
2020/2019	2.3	0.7	1.5	-1.1	2.0	2.6	3.5	2.0
2021/2020	2.3	1.4	1.6	1.3	2.0	2.4	3.8	2.0
2022/2021	2.1	1.6	1.7	2.0	2.0	2.3	3.3	2.0
2023/2022	2.0	1.6	1.8	2.0	2.0	2.2	3.2	2.0
2018Q4/2017Q4	3.0	3.6	3.4	11.9	2.4	1.8	3.1	2.2
2019Q4/2018Q4	2.6	0.2	1.3	-0.2	2.0	2.7	3.2	1.8
2020Q4/2019Q4	2.1	1.0	1.4	-1.1	1.9	2.5	3.7	1.9

Notes: (a) Per barrel, average of Dubai and Brent spot prices.

Table A3. Gross domestic product and components of expenditure

£ billion, 2016 prices

	Final consumption expenditure		Gross capital formation		Domestic demand	Total exports ^(c)	Total final expenditure	Total imports ^(c)	Net trade	GDP at market prices ^(d)
	Households & NPISH ^(a)	General govt.	Gross fixed investment	Changes in inventories ^(b)						
2013	1198	352	292	8	1839	516	2355	520	-4	1836
2014	1222	360	314	14	1902	528	2430	540	-12	1891
2015	1253	365	324	11	1953	551	2504	569	-18	1935
2016	1293	368	331	8	2000	557	2557	588	-31	1970
2017	1319	367	343	-2	2028	588	2616	609	-20	2005
2018	1341	369	344	6	2060	589	2649	613	-24	2034
2019	1362	376	346	8	2091	604	2695	632	-28	2061
2020	1380	387	355	-3	2119	624	2742	647	-24	2093
2021	1399	400	364	-2	2162	645	2807	671	-26	2133
2022	1420	412	373	-2	2204	668	2871	695	-27	2175
2023	1443	423	382	-2	2245	689	2934	717	-28	2216
<i>Percentage changes</i>										
2013/2012	1.8	-0.2	3.4		2.5	1.5	2.3	3.2		2.0
2014/2013	2.0	2.2	7.2		3.4	2.3	3.1	3.8		2.9
2015/2014	2.6	1.4	3.4		2.7	4.4	3.1	5.5		2.3
2016/2015	3.1	0.8	2.3		2.4	1.0	2.1	3.3		1.8
2017/2016	2.1	-0.2	3.5		1.4	5.6	2.3	3.5		1.8
2018/2017	1.7	0.4	0.2		1.6	0.1	1.3	0.7		1.4
2019/2018	1.5	2.0	0.6		1.5	2.5	1.7	3.2		1.4
2020/2019	1.3	2.9	2.6		1.3	3.3	1.8	2.4		1.6
2021/2020	1.4	3.5	2.6		2.0	3.5	2.3	3.7		1.9
2022/2021	1.5	2.9	2.6		2.0	3.5	2.3	3.5		1.9
2023/2022	1.6	2.6	2.3		1.9	3.2	2.2	3.2		1.9
<i>Decomposition of growth in GDP</i>										
2013	1.2	0.0	0.5	0.5	2.5	0.5	3.0	-0.9	-0.5	2.0
2014	1.3	0.4	1.1	0.4	3.4	0.7	4.0	-1.1	-0.4	2.9
2015	1.7	0.3	0.6	-0.2	2.7	1.2	3.9	-1.6	-0.3	2.3
2016	2.0	0.1	0.4	-0.1	2.4	0.3	2.8	-1.0	-0.7	1.8
2017	1.4	0.0	0.6	-0.5	1.4	1.6	3.0	-1.0	0.5	1.8
2018	1.1	0.1	0.0	0.4	1.6	0.0	1.6	-0.2	-0.2	1.4
2019	1.0	0.4	0.1	0.1	1.6	0.7	2.3	-1.0	-0.2	1.4
2020	0.9	0.5	0.4	-0.5	1.3	1.0	2.3	-0.7	0.2	1.6
2021	0.9	0.6	0.4	0.0	2.0	1.0	3.1	-1.2	-0.1	1.9
2022	1.0	0.5	0.4	0.0	2.0	1.1	3.0	-1.1	0.0	1.9
2023	1.0	0.5	0.4	0.0	1.9	1.0	2.9	-1.0	0.0	1.9

Notes: (a) Non-profit institutions serving households. (b) Including acquisitions less disposals of valuables and quarterly alignment adjustment. (c) Includes Missing Trader Intra-Community Fraud. (d) Components may not add up to total GDP growth due to rounding and the statistical discrepancy included in GDP.

Table A4. External sector

	Exports of goods ^(a)	Imports of goods ^(a)	Net trade in goods ^(a)	Exports of services	Imports of services	Net trade in services ness ^(c)	Export price competitiveness ^(c)	World trade ^(d)	Terms of trade ^(e)	Current balance
	£ billion, 2016 prices ^(b)						2016=100		% of GDP	
2013	277	385	-108	240	135	105	98.9	87.3	95.4	-5.1
2014	284	398	-114	244	141	104	102.3	91.3	96.7	-4.9
2015	303	416	-113	248	153	95	103.2	96.5	98.2	-4.9
2016	299	432	-133	258	156	102	100.0	100.0	100.0	-5.2
2017	319	451	-132	269	158	111	95.9	103.6	99.6	-3.3
2018	319	448	-130	270	164	106	98.0	107.4	99.4	-3.9
2019	328	464	-136	276	168	108	98.2	112.0	99.5	-4.2
2020	345	479	-134	278	168	110	97.6	116.9	100.3	-3.1
2021	361	501	-140	284	170	114	96.9	121.5	100.5	-2.8
2022	376	522	-146	292	174	119	96.6	126.2	100.6	-2.4
2023	389	540	-151	301	177	123	96.8	130.9	100.8	-2.0
<i>Percentage changes</i>										
2013/2012	-0.8	3.0		4.9	3.5		0.2	2.9	1.1	
2014/2013	2.6	3.6		1.9	4.5		3.4	4.6	1.3	
2015/2014	6.7	4.4		1.6	8.9		0.9	5.7	1.5	
2016/2015	-1.3	3.8		3.9	1.8		-3.1	3.6	1.9	
2017/2016	6.7	4.4		4.4	1.0		-4.1	3.6	-0.4	
2018/2017	-0.1	-0.6		0.4	4.1		2.2	3.6	-0.2	
2019/2018	2.8	3.4		2.1	2.5		0.2	4.2	0.2	
2020/2019	5.4	3.4		0.8	-0.3		-0.7	4.5	0.8	
2021/2020	4.5	4.5		2.2	1.4		-0.7	3.9	0.2	
2022/2021	4.1	4.0		2.8	2.0		-0.2	3.9	0.1	
2023/2022	3.4	3.5		2.9	2.2		0.1	3.7	0.2	

Notes: (a) Includes Missing Trader Intra-Community Fraud. (b) Balance of payments basis. (c) A rise denotes a loss in UK competitiveness. (d) Weighted by import shares in UK export markets. (e) Ratio of average value of exports to imports.

Table A5. Household sector

	Average ^(a) earnings	Compen- sation of employees	Total personal income	Gross disposable income	Real disposable income ^(b)	Final consumption expenditure	Saving ratio ^(c)	House prices ^(d)	Net worth to income ratio ^(e)
	2016=100	£ billion, current prices			£ billion, 2016 prices		per cent		
2013	95.9	881	1533	1206	1254	1198	8.6	89.9	6.2
2014	96.3	900	1578	1243	1267	1222	8.6	97.1	6.7
2015	97.3	929	1665	1314	1333	1253	9.4	102.9	6.7
2016	100.0	963	1701	1333	1333	1293	6.7	110.1	7.3
2017	103.1	1004	1756	1367	1339	1319	4.2	115.1	7.4
2018	105.8	1046	1831	1426	1366	1341	4.5	118.8	7.2
2019	109.6	1087	1905	1483	1393	1362	4.8	121.7	7.3
2020	113.8	1129	1988	1548	1425	1380	5.7	125.1	7.1
2021	117.8	1177	2076	1617	1460	1399	6.6	127.4	7.0
2022	121.9	1225	2169	1689	1496	1420	7.5	128.6	6.8
2023	126.1	1274	2264	1761	1529	1443	8.1	129.3	6.7
<i>Percentage changes</i>									
2013/2012	2.7	3.9	3.5	3.7	1.3	1.8		2.6	
2014/2013	0.4	2.2	2.9	3.0	1.1	2.0		8.0	
2015/2014	1.0	3.2	5.6	5.7	5.2	2.6		6.0	
2016/2015	2.7	3.8	2.2	1.4	0.0	3.1		7.0	
2017/2016	3.1	4.2	3.2	2.6	0.4	2.1		4.5	
2018/2017	2.6	4.2	4.3	4.4	2.1	1.7		3.3	
2019/2018	3.7	3.9	4.1	4.0	2.0	1.5		2.4	
2020/2019	3.8	3.9	4.4	4.4	2.3	1.3		2.8	
2021/2020	3.5	4.2	4.4	4.4	2.4	1.4		1.8	
2022/2021	3.5	4.1	4.5	4.5	2.4	1.5		0.9	
2023/2022	3.4	4.0	4.4	4.3	2.3	1.6		0.5	

Notes: (a) Average earnings equals total labour compensation divided by the number of employees. (b) Deflated by consumers' expenditure deflator. (c) Includes adjustment for change in net equity of households in pension funds. (d) Office for National Statistics, mix-adjusted. (e) Net worth is defined as housing wealth plus net financial assets.

Table A6. Fixed investment and capital £ billion, 2016 prices

	Gross fixed investment				User cost of capital (%)	Corporate profit share of GDP (%)	Capital stock	
	Business investment	Private housing ^(a)	General government	Total			Private	Public ^(b)
2013	172	65	56	292	12.2	24.6	3247	1020
2014	181	72	61	314	12.1	25.6	3291	1072
2015	187	76	61	324	10.9	24.9	3348	1104
2016	187	83	61	331	10.6	25.0	3402	1115
2017	190	90	63	343	11.5	24.9	3504	1065
2018	188	95	60	344	12.0	24.2	3551	1095
2019	186	97	63	346	11.8	23.7	3595	1128
2020	190	101	64	355	12.0	24.0	3645	1162
2021	194	105	65	364	12.2	24.2	3699	1197
2022	199	108	66	373	12.3	24.5	3759	1234
2023	204	111	67	382	12.4	24.9	3822	1273
<i>Percentage changes</i>								
2013/2012	2.9	12.2	-3.8	3.4			0.8	1.1
2014/2013	5.2	10.0	9.7	7.2			1.4	5.1
2015/2014	3.7	6.0	-0.8	3.4			1.7	3.1
2016/2015	-0.2	9.4	1.0	2.3			1.6	1.0
2017/2016	1.5	8.2	2.9	3.5			3.0	-4.5
2018/2017	-0.9	5.0	-5.0	0.2			1.3	2.7
2019/2018	-1.1	2.4	4.9	0.6			1.3	3.0
2020/2019	2.0	4.0	2.4	2.6			1.4	3.0
2021/2020	2.3	3.8	1.6	2.6			1.5	3.1
2022/2021	2.5	3.4	1.5	2.6			1.6	3.1
2023/2022	2.4	2.5	1.6	2.3			1.7	3.1

Notes: (a) Includes private sector transfer costs of non-produced assets. (b) Including public sector non-financial corporations.

Table A7. Productivity and the labour market

Thousands

	Employment		ILO unemploy- ment	Labour force ^(b)	Population of working age ^(c)	Productivity (2016=100) Per hour	ILO unemployment rate %
	Employees	Total ^(a)					
2013	25514	30043	2474	32517	40550	97.9	7.6
2014	25960	30754	2026	32780	40681	98.5	6.2
2015	26504	31285	1781	33066	40879	99.5	5.4
2016	26771	31744	1633	33377	41062	100.0	4.9
2017	27065	32057	1476	33533	41169	101.0	4.4
2018	27494	32439	1380	33819	41260	101.5	4.1
2019	27554	32629	1334	33963	41340	102.3	3.9
2020	27587	32724	1411	34135	41430	103.5	4.1
2021	27766	32919	1377	34296	41518	104.9	4.0
2022	27930	33082	1365	34447	41590	106.4	4.0
2023	28072	33223	1374	34597	41656	107.9	4.0
<i>Percentage changes</i>							
2013/2012	1.2	1.2	-3.8	0.8	0.1	-0.4	
2014/2013	1.7	1.7	-12.1	0.9	0.5	1.0	
2015/2014	2.1	1.7	-12.1	0.9	0.5	1.0	
2016/2015	1.0	1.5	-8.3	0.9	0.4	0.5	
2017/2016	1.1	1.0	-9.6	0.5	0.3	1.0	
2018/2017	1.6	1.2	-6.5	0.9	0.2	0.5	
2019/2018	0.2	0.6	-3.3	0.4	0.2	0.7	
2020/2019	0.1	0.3	5.8	0.5	0.2	1.2	
2021/2020	0.6	0.6	-2.4	0.5	0.2	1.3	
2022/2021	0.6	0.5	-0.9	0.4	0.2	1.4	
2023/2022	0.5	0.4	0.7	0.4	0.2	1.5	

Notes: (a) Includes self-employed, government-supported trainees and unpaid family members. (b) Employment plus ILO unemployment. (c) Population projections are based on annual rates of growth from 2016-based population projections by the ONS.

Table A8. Public sector financial balance and borrowing requirement

£ billion, fiscal years

		2015–16	2016–17	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23
Current receipts:	Taxes on income	401.6	434.1	450.4	470.1	488.6	506.2	528.5	553.0
	Taxes on expenditure	243.2	252.5	266.4	274.3	281.3	290.6	300.6	311.2
	Other current receipts	39.5	39.2	35.9	38.5	38.2	39.9	41.6	43.4
	Total	684.2	725.8	752.7	789.0	808.1	836.7	870.7	907.5
	(as a % of GDP)	35.8	36.4	36.4	37.0	36.4	36.2	36.1	36.1
Current expenditure	Goods and services	362.6	369.3	377.6	389.8	406.3	429.2	454.2	478.2
	Net social benefits paid	232.8	233.6	236.7	242.6	252.3	262.8	273.1	284.5
	Debt interest	38.4	40.4	44.8	41.2	41.9	42.5	43.3	44.2
	Other current expenditure	48.9	49.3	52.1	56.9	64.6	67.0	69.5	72.1
	Total	682.7	692.7	711.2	730.5	765.0	801.5	840.1	879.0
	(as a % of GDP)	35.7	34.8	34.4	34.2	34.5	34.6	34.8	35.0
Depreciation		40.1	40.8	41.1	40.3	41.6	43.2	44.9	46.7
Surplus on public sector current budget ^(a)		-38.6	-7.7	0.4	18.2	1.4	-8.1	-14.4	-18.3
(as a % of GDP)		-2.0	-0.4	0.0	0.8	0.1	-0.3	-0.6	-0.7
Gross investment		74.2	79.3	82.9	79.7	80.5	83.6	86.4	87.3
Net investment		34.1	38.5	41.9	39.4	38.9	40.3	41.5	40.6
(as a % of GDP)		1.8	1.9	2.0	1.8	1.8	1.7	1.7	1.6
Total managed expenditure		756.9	772.0	794.2	811.8	845.6	885.1	926.5	966.3
(as a % of GDP)		39.5	38.8	38.5	38.0	38.1	38.3	38.4	38.4
Public sector net borrowing		72.7	46.2	41.4	22.8	37.5	48.4	55.8	58.9
(as a % of GDP)		3.8	2.3	2.0	1.3	1.7	2.1	2.3	2.3
Public sector net debt (% of GDP) (b)		82.9	86.3	84.9	82.9	81.4	79.2	77.3	77.5
GDP deflator at market prices (2016=100)		98.4	100.6	102.7	104.5	107.3	110.0	112.6	115.1
Money GDP		1913.9	1991.2	2065.5	2134.9	2218.1	2313.7	2412.5	2514.5
Financial balance under Maastricht (% of GDP) ^(c)		-4.2	-2.9	-1.9	-1.5	-1.6	-2	-2.3	-2.4
Gross debt under Maastricht (% of GDP) ^(c)		87.2	87.2	86.5	86.1	84.5	82.9	81.7	80.6

Notes: These data are constructed from seasonally adjusted national accounts data. This results in differences between the figures here and unadjusted fiscal year data. Data exclude the impact of financial sector interventions, but include flows from the Asset Purchase Facility of the Bank of England. (a) Public sector current budget surplus is total current receipts less total current expenditure and depreciation. (b) Data for Q2. Seasonal adjustment applied in NiGEM results in differences between the figures here and official unadjusted PSF data. (c) Calendar year.

Table A9. Saving and investment

As a percentage of GDP

	Households		Companies		General government		Whole economy		Finance from abroad ^(a)		Net national saving
	Saving	Investment	Saving	Investment	Saving	Investment	Saving	Investment	Total	Net factor income	
2013	6.1	3.7	7.7	10.3	-2.5	2.5	11.4	16.5	5.1	2.0	-0.9
2014	6.1	3.8	8.6	10.8	-2.3	2.6	12.3	17.3	4.9	2.0	0.1
2015	6.8	3.9	6.7	10.7	-1.1	2.6	12.3	17.2	4.9	2.2	0.1
2016	4.8	4.1	7.3	10.7	0.0	2.5	12.0	17.3	5.2	2.4	-0.2
2017	2.9	4.3	9.8	10.3	1.2	2.6	13.9	17.3	3.3	1.1	1.7
2018	3.1	4.4	8.8	10.3	1.5	2.6	13.4	17.3	3.9	1.2	1.3
2019	3.3	4.3	8.6	10.3	1.2	2.7	13.1	17.3	4.2	1.5	1.0
2020	3.9	4.4	9.0	9.7	0.8	2.7	13.7	16.8	3.1	0.8	1.6
2021	4.6	4.4	9.0	9.7	0.5	2.7	14.0	16.9	2.8	0.6	2.0
2022	5.2	4.5	9.0	9.8	0.4	2.7	14.6	17.0	2.4	0.1	2.5
2023	5.7	4.5	8.9	9.8	0.5	2.7	15.1	17.0	2.0	-0.2	3.0

Notes: Saving and investment data are gross of depreciation unless otherwise stated. (a) Negative sign indicates a surplus for the UK.

Table A10. Medium and long-term projections

All figures percentage change unless otherwise stated

	2017	2018	2019	2020	2021	2022	2023	2024–28
GDP (market prices)	1.8	1.4	1.4	1.6	1.9	1.9	1.9	1.5
Average earnings	3.1	2.6	3.7	3.8	3.5	3.5	3.4	3.2
GDP deflator (market prices)	2.2	1.9	2.3	2.6	2.4	2.3	2.2	2.2
Consumer Prices Index	2.7	2.4	1.8	2.0	2.0	2.0	2.0	1.9
Per capita GDP	1.2	0.8	0.7	1.0	1.3	1.4	1.4	1.1
Whole economy productivity ^(a)	1.0	0.5	0.7	1.2	1.3	1.4	1.5	1.2
Labour input ^(b)	1.1	0.8	0.6	0.3	0.6	0.5	0.4	0.3
ILO Unemployment rate (%)	4.4	4.1	3.9	4.1	4.0	4.0	4.0	4.3
Current account (% of GDP)	-3.3	-3.9	-4.2	-3.1	-2.8	-2.4	-2.0	-1.5
Total managed expenditure (% of GDP)	38.5	37.9	38.2	38.2	38.4	38.4	38.4	39.1
Public sector net borrowing (% of GDP)	1.9	1.4	1.6	2.0	2.3	2.4	2.3	2.1
Public sector net debt (% GDP)	85.8	84.6	82.9	81.2	78.9	77.4	77.4	75.4
Effective exchange rate (2011=100)	99.2	101.3	103.2	103.8	104.0	104.3	104.6	105.2
Bank Rate (%)	0.3	0.6	0.8	0.9	1.1	1.2	1.4	2.3
3 month interest rates (%)	0.4	0.7	0.9	1.0	1.3	1.4	1.6	2.5
10 year interest rates (%)	1.2	1.4	1.2	1.6	2.0	2.3	2.7	3.5

Notes: (a) Per hour. (b) Total hours worked.