

# Inflation Report

February 2017



BANK OF ENGLAND





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In order to maintain price stability, the Government has set the Bank's Monetary Policy Committee (MPC) a target for the annual inflation rate of the Consumer Prices Index of 2%. Subject to that, the MPC is also required to support the Government's economic policy, including its objectives for growth and employment.

The *Inflation Report* is produced quarterly by Bank staff under the guidance of the members of the Monetary Policy Committee. It serves two purposes. First, its preparation provides a comprehensive and forward-looking framework for discussion among MPC members as an aid to our decision-making. Second, its publication allows us to share our thinking and explain the reasons for our decisions to those whom they affect.

Although not every member will agree with every assumption on which our projections are based, the fan charts represent the MPC's best collective judgement about the most likely paths for inflation, output and unemployment, as well as the uncertainties surrounding those central projections.

This *Report* has been prepared and published by the Bank of England in accordance with section 18 of the Bank of England Act 1998.

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The *Inflation Report* is available in PDF alongside PowerPoint™ versions of the charts and Excel spreadsheets of the data underlying most of them at [www.bankofengland.co.uk/publications/Pages/inflationreport/2017/feb.aspx](http://www.bankofengland.co.uk/publications/Pages/inflationreport/2017/feb.aspx).

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# Monetary Policy Summary

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The Bank of England's Monetary Policy Committee (MPC) sets monetary policy to meet the 2% inflation target, and in a way that helps to sustain growth and employment. At its meeting ending on 1 February 2017, the Committee voted unanimously to maintain Bank Rate at 0.25%. The Committee voted unanimously to continue with the programme of sterling non-financial investment-grade corporate bond purchases, financed by the issuance of central bank reserves, totalling up to £10 billion. The Committee also voted unanimously to maintain the stock of UK government bond purchases, financed by the issuance of central bank reserves, at £435 billion.

As the MPC had observed at the time of the UK's referendum on membership of the EU, the appropriate path for monetary policy depends on the evolution of demand, potential supply, the exchange rate, and therefore inflation. The Committee's latest economic projections are contained in the February *Inflation Report*. The MPC has increased its central expectation for growth in 2017 to 2.0% and expects growth of 1.6% in 2018 and 1.7% in 2019. The upgraded outlook over the forecast period reflects the fiscal stimulus announced in the Chancellor's Autumn Statement, firmer momentum in global activity, higher global equity prices and more supportive credit conditions, particularly for households. Domestic demand has been stronger than expected over the past few months, and there have been relatively few signs of the slowdown in consumer spending that the Committee had anticipated following the referendum. Nevertheless, continued moderation in pay growth and higher import prices following sterling's depreciation are likely to mean materially weaker household real income growth over the coming few years. As a consequence, real consumer spending is likely to slow.

In preparing the February *Report*, the MPC undertook its scheduled regular assessment of aggregate supply-side conditions. Pay growth, although edging up, has remained persistently subdued by historical standards — strikingly so in light of the decline in the rate of unemployment to below 5%. This is likely to have reflected somewhat stronger labour supply than previously assumed and, therefore, the presence of a greater margin of slack in the labour market, restraining wage increases. This updated assessment means that the stronger path for demand in the February projection is roughly matched by higher supply capacity. Combined with the 3% appreciation of sterling and a somewhat higher yield curve over the past three months, that results in a projected path of inflation that is similar to the one expected in November, despite the stronger growth outlook.

The value of sterling remains 18% below its peak in November 2015, reflecting investors' perceptions that a lower real exchange rate will be required following the UK's withdrawal from the EU. Over the next few years, a consequence of weaker sterling is that the higher imported costs resulting from it will boost consumer prices and cause inflation to overshoot the 2% target. This effect is already becoming evident in the data. CPI inflation rose to 1.6% in December and further substantial increases are very likely over the coming months. In the central projection, conditioned on market yields that are somewhat higher than in November, inflation is expected to increase to 2.8% in the first half of 2018, before falling back gradually to 2.4% in three years' time. Inflation is judged likely to return to close to the target over the subsequent year. Measures of inflation compensation derived from financial markets have stabilised at around average historical levels, having increased during late 2016 as concerns about a period of unusually low inflation faded.

Monetary policy cannot prevent either the real adjustment that is necessary as the UK moves towards its new international trading arrangements or the weaker real income growth that is likely to accompany it over the next few years. Attempting to offset fully the effect of weaker sterling on inflation would be achievable only at the cost of higher

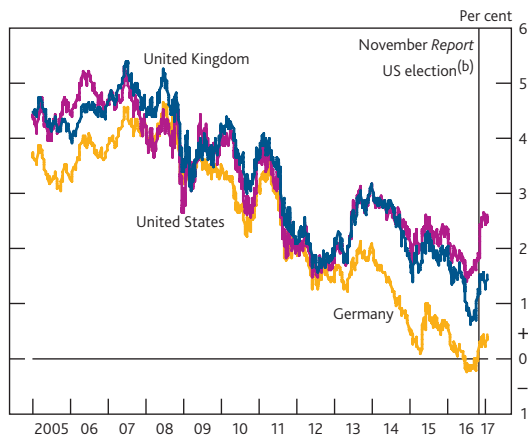
unemployment and, in all likelihood, even weaker income growth. For this reason, the MPC's remit specifies that in such exceptional circumstances the Committee must balance the trade-off between the speed with which it intends to return inflation to the target and the support that monetary policy provides to jobs and activity. At its February meeting, the MPC continued to judge that it remained appropriate to seek to return inflation to the target over a somewhat longer period than usual, and that the current stance of monetary policy remained appropriate to balance the demands of the Committee's remit.

As the Committee has previously noted, however, there are limits to the extent that above-target inflation can be tolerated. The continuing suitability of the current policy stance depends on the trade-off between above-target inflation and slack in the economy. The projections described in the *Inflation Report* depend in good part on three main judgements: that the lower level of sterling continues to boost consumer prices broadly as expected, and without adverse consequences for expectations of inflation further ahead; that regular pay growth does indeed remain modest, consistent with the Committee's updated assessment of the remaining degree of slack in the labour market; and that the hitherto resilient rates of household spending growth slow as real income gains weaken. In judging the appropriate policy stance, the Committee will be monitoring closely the incoming evidence regarding these and other factors. For instance, if spending growth slows more abruptly than expected, there is scope for monetary policy to be loosened. If, on the other hand, pay growth picks up by more than anticipated, monetary policy may need to be tightened to a greater degree than the gently rising path implied by market yields. Monetary policy can respond, in either direction, to changes to the economic outlook as they unfold to ensure a sustainable return of inflation to the 2% target.

# 1 Financial markets and global economic developments

Since the *November Report*, there have been rises in government bond yields and equity prices globally. Market contacts attribute these moves primarily to greater near-term momentum in global activity growth and an anticipated expansion of US fiscal policy further ahead. Sterling has been volatile, probably reflecting changing expectations of the form and impact of Brexit.

**Chart 1.1 Long-term interest rates have risen globally**  
Ten-year nominal government bond yields<sup>(a)</sup>

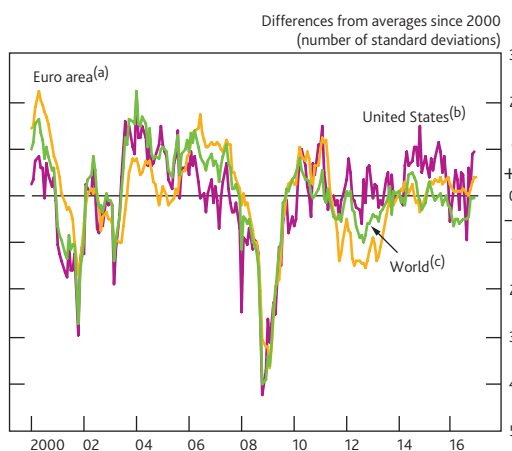


Sources: Bloomberg and Bank calculations.

- (a) Zero-coupon spot rates derived from government bond prices.  
(b) The US presidential election, on 8 November 2016, was three working days after the *November Report* was published.

**Chart 1.2 Survey indicators of global growth have picked up in recent months**

Survey measures of international output growth



Sources: IHS Markit, JPMorgan, Thomson Reuters Datastream, US Bureau of Economic Analysis and US Institute for Supply Management (ISM).

- (a) Composite (manufacturing and services) purchasing managers' index (PMI) survey indices of monthly output growth. Last data point is the flash estimate for January 2017.  
(b) Manufacturing production and non-manufacturing business activity ISM survey indices of monthly output growth, weighted together using their nominal shares in value added. Last data point is December 2016.  
(c) Composite (manufacturing and services) PMI survey indices of monthly output growth. Based on the results of surveys in over 30 countries. Together these countries account for an estimated 87% of global GDP. Last data point is December 2016.

Developments in the US economy and financial markets appear to have been important influences on asset prices and activity in the rest of the world in recent months. Since the *November Report*, there have been sharp rises in US long-term interest rates (**Chart 1.1**) and US equity prices (**Section 1.1**). Longer-term government bond yields have also risen in other advanced economies.

Alongside anticipation of a more expansionary US fiscal stance, market contacts suggest that those moves in asset prices reflect building momentum in indicators of near-term global activity growth (**Chart 1.2**). Quarterly UK-weighted global GDP growth picked up to 0.5% in 2016 Q3 (**Table 1.A**) and is expected to have risen further to 0.6% in Q4, a faster rate than anticipated in November. That is consistent with the rise in the global composite PMI output survey indicator. The near-term outlook for global GDP growth is also stronger than projected in November, mainly reflecting more momentum in euro-area activity than expected and sharp rises in consumer and business confidence (**Section 1.2**). Some other survey indicators such as the global manufacturing and export orders PMIs point to slightly stronger global activity growth and so suggest an upside risk to the outlook. Further ahead, the projections for US and global GDP growth are also somewhat stronger than three months ago (**Section 5**).

Both headline and core inflation had been subdued in many countries in recent years (**Table 1.B**). But the pickup in global commodity prices over 2016 (**Section 4**) is now being reflected in rises in headline inflation, and the pickup in global growth should provide further support to inflation.

Developments in global demand and inflation will affect the quantities (**Section 2**) and prices (**Section 4**) of UK exports and imports. And developments in global asset prices will affect UK asset prices and credit conditions for UK firms and households (**Section 1.4**). Sterling has been volatile and, according to market contacts and event studies, it has been sensitive to changing perceptions of the United Kingdom's likely future trading relationships following Brexit. In the run-up to the *February Report*, it was 3% higher than at the

**Table 1.A Global activity growth picked up in 2016 H2**  
GDP in selected countries and regions<sup>(a)</sup>

	Averages			2016			
	1998–2007	2012–13	2014–15	Q1	Q2	Q3	Q4
	United Kingdom	2.9	1.9	2.6	1.4	2.6	2.3
Euro area (38%)	2.3	-0.2	1.7	2.0	1.2	1.8	2.0
United States (20%)	3.0	2.0	2.2	0.8	1.4	3.5	1.9
China (3%) <sup>(b)</sup>	10.0	7.8	7.1	6.7	6.7	6.7	6.8
Japan (2%)	1.1	1.5	0.5	2.8	1.8	1.3	n.a.
India (1%) <sup>(b)</sup>	n.a.	6.2	7.1	7.9	7.1	7.3	n.a.
Russia (1%) <sup>(c)</sup>	7.6	1.7	-1.9	-0.9	-0.1	n.a.	n.a.
Brazil (1%)	3.1	2.6	-3.0	-1.8	-1.7	-3.3	n.a.
UK-weighted world GDP <sup>(d)</sup>	3.0	1.6	2.3	2.1	1.7	2.1	n.a.

Sources: IMF *World Economic Outlook* (WEO), OECD, ONS, Thomson Reuters Datastream and Bank calculations.

(a) Real GDP measures. Figures in parentheses are shares in UK goods and services exports in 2015.

(b) Data are four-quarter growth. The earliest observation for India is 2012 Q2.

(c) The earliest observation for Russia is 2003 Q2.

(d) Constructed using data for real GDP growth rates for 180 countries weighted according to their shares in UK exports. For the vast majority of countries, the latest observation is 2016 Q3. For those countries where data are not yet available, Bank staff projections are used.

**Table 1.B Inflation in advanced economies has picked up**  
Inflation in selected countries and regions

Per cent	Monthly averages				2016			2017
	1998–2007	2015	2016 H1	2016 Q3	Oct.	Nov.	Dec.	Jan.
<b>Annual headline consumer price inflation</b>								
United Kingdom	1.6	0.0	0.4	0.7	0.9	1.2	1.6	n.a.
Euro area <sup>(a)</sup>	2.0	0.0	0.0	0.3	0.5	0.6	1.1	1.8
United States <sup>(b)</sup>	2.0	0.3	0.9	1.0	1.4	1.4	1.6	n.a.
UK-weighted world inflation <sup>(c)</sup>	2.0	0.5	0.7	0.7	n.a.	n.a.	n.a.	n.a.
<b>Annual consumer price inflation excluding food and energy<sup>(d)</sup></b>								
United Kingdom	1.2	1.1	1.3	1.4	1.2	1.4	1.6	n.a.
Euro area <sup>(a)</sup>	1.6	0.8	0.9	0.8	0.8	0.8	0.9	0.9
United States <sup>(b)</sup>	1.8	1.4	1.6	1.7	1.8	1.7	1.7	n.a.

Sources: Eurostat, IMF WEO, ONS, Thomson Reuters Datastream, US Bureau of Economic Analysis and Bank calculations.

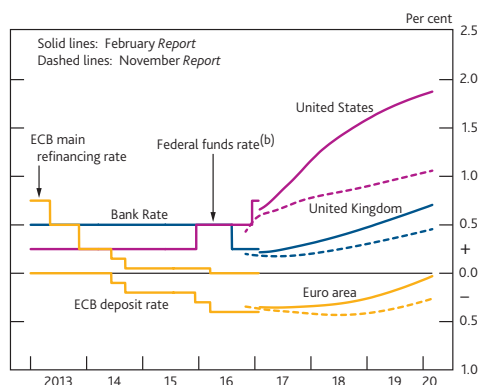
(a) Data points for January 2017 are flash estimates.

(b) Personal consumption expenditure price index inflation. Data point for December 2016 is a preliminary estimate.

(c) Constructed using data for consumption deflators for 51 countries weighted according to their shares in UK exports. For the vast majority of countries, the latest observation is 2016 Q3. Where data are not yet available, Bank staff projections are used.

(d) For the euro area and the United Kingdom, excludes energy, food, alcoholic beverages and tobacco. For the United States, excludes food and energy.

**Chart 1.3 Market-implied paths for short-term interest rates have risen internationally**  
International forward interest rates<sup>(a)</sup>



Sources: Bank of England, Bloomberg, European Central Bank (ECB) and Federal Reserve.

(a) The February 2017 and November 2016 curves are estimated using instantaneous forward overnight index swap rates in the fifteen working days to 25 January 2017 and 26 October 2016 respectively.

(b) Upper bound of the target range.

time of the November *Report*. UK market interest rates have picked up a little, which is likely to feed through gradually to higher interest rates for households and companies.

## 1.1 Developments in the United States

The market-implied path for US short-term interest rates has steepened markedly since the US presidential election in early November (**Chart 1.3**). On 14 December, the Federal Open Market Committee (FOMC) increased the target range for the federal funds rate from between  $\frac{1}{4}\%$  and  $\frac{1}{2}\%$  to between  $\frac{1}{2}\%$  and  $\frac{3}{4}\%$ . That was in line with market expectations, and came against a backdrop of continued strengthening in US economic activity and the labour market. The median of FOMC members' expected future paths for interest rates was revised up slightly, and now reaches 2.9% by the end of 2019. The path implied by market interest rates has risen more substantially, reaching 1.9% in three years' time, compared to 1.0% at the time of the November *Report* — closing some of the gap with the median FOMC members' path.

Alongside the rise in US short-term interest rates, the US dollar (**Chart 1.4**), equity prices (**Chart 1.5**) and long-term forward interest rates have also risen. For example, the implied cost of US government borrowing five to ten years ahead has risen by 0.8 percentage points since November (the US diamond in **Chart 1.6**).

Changes in long-term interest rates will reflect both changes in expected policy rates over that horizon and so-called 'term premia'. Term premia represent the additional compensation that investors require for holding long-term bonds, and will reflect investors' preferences and perceptions of the risk around the paths of future interest rates and inflation. Model-based estimates of those term premia suggest that they, rather than changes in expected policy rates, account for most of the rise in long-term forward rates in the United States since November (**Chart 1.6**), having been unusually compressed earlier in 2016.

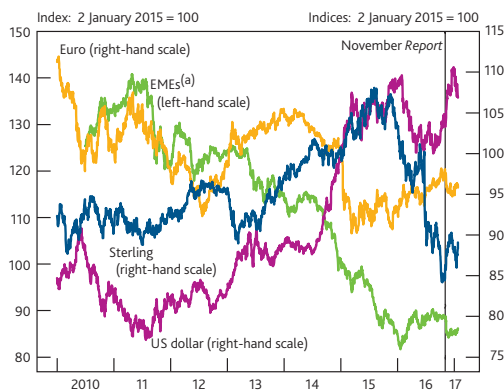
The rise in term premia could partly reflect reduced perceptions of the risk of a prolonged period of very weak US GDP growth and low inflation. Indeed, the prices of inflation-linked bonds suggest that the rise in US rates has reflected both a pickup in inflation compensation and a rise in real interest rates (**Chart 1.7**). Despite their rise, long-term interest rates are only back to around their 2014 levels and remain substantially below their average levels in recent decades (**Chart 1.1**).<sup>(1)</sup>

Although quarterly US GDP growth fell back from 0.9% in 2016 Q3 to 0.5% in Q4 (**Table 1.A**), that largely reflected the

(1) See the box on pages 8–9 of the November 2016 *Report* for more information on the factors driving the long-term downward trend in interest rates in recent decades; [www.bankofengland.co.uk/publications/Pages/inflationreport/2016/nov.aspx](http://www.bankofengland.co.uk/publications/Pages/inflationreport/2016/nov.aspx).

### Chart 1.4 Sterling has been volatile

Effective exchange rates

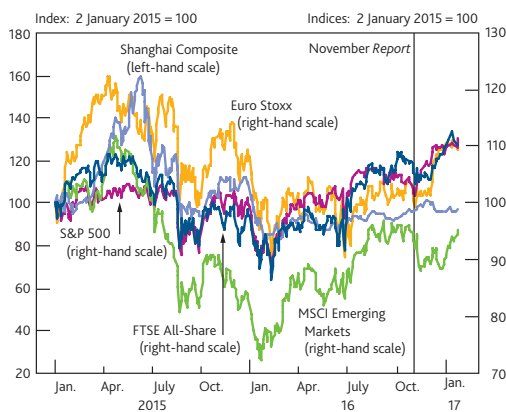


Sources: Bank of England, JPMorgan and Bank calculations.

(a) JPMorgan Emerging Markets Currency Index. Data begin in July 2010.

### Chart 1.5 Equity prices in advanced economies have risen

International equity prices<sup>(a)</sup>

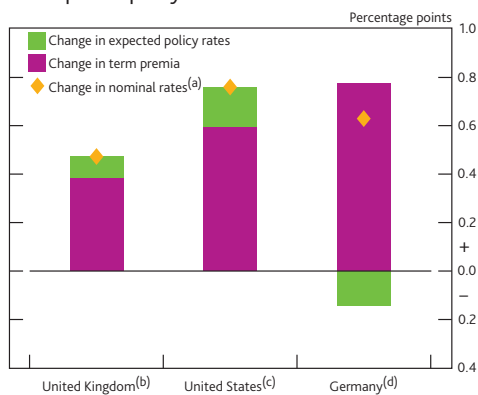


Sources: MSCI, Thomson Reuters Datastream and Bank calculations.

(a) In local currency terms, except for MSCI Emerging Markets, which is in US dollar terms. The MSCI Inc. disclaimer of liability, which applies to the data provided, is available at [www.bankofengland.co.uk/publications/Pages/inflationreport/2017/feb.aspx](http://www.bankofengland.co.uk/publications/Pages/inflationreport/2017/feb.aspx).

### Chart 1.6 Rises in long-term interest rates have reflected changes in compensation for risk

Decomposition of changes in five-year, five-year forward nominal interest rates since the November Report into estimated term premia and expected policy rates



Sources: Bloomberg, Federal Reserve Bank of New York and Bank calculations.

(a) Zero-coupon five-year, five-year forward rates derived from government bonds.

(b) Term premia estimates are derived using an average of four models: the benchmark and survey-augmented models in Malik, S and Meldrum, A (2014), 'Evaluating the robustness of UK term structure decompositions using linear regression methods', *Bank of England Working Paper No. 518*; [www.bankofengland.co.uk/research/Documents/workingpapers/2014/wp518.pdf](http://www.bankofengland.co.uk/research/Documents/workingpapers/2014/wp518.pdf); Andreasen, M and Meldrum, A (2015), 'Market beliefs about the UK monetary policy lift-off horizon: a no-arbitrage shadow rate term structure model approach', *Bank of England Staff Working Paper No. 541*; [www.bankofengland.co.uk/research/Documents/workingpapers/2015/swp541.pdf](http://www.bankofengland.co.uk/research/Documents/workingpapers/2015/swp541.pdf); and Vlieghe, G (2016), 'Monetary policy expectations and long-term interest rates'; [www.bankofengland.co.uk/publications/Documents/speeches/2016/speech909.pdf](http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech909.pdf).

(c) Term premia estimates from [www.newyorkfed.org/research/data\\_indicators/term\\_premia.html](http://www.newyorkfed.org/research/data_indicators/term_premia.html).

(d) Term premia estimates derived using the Malik and Meldrum (2014) benchmark model.

unwind of an erratic boost from net trade in Q3. Employment growth has remained robust and the unemployment rate has fallen further. At 4.7% in December, it was slightly below the median projection of FOMC members for the longer-run unemployment rate. Despite that fall in unemployment, four-quarter growth in wages, as measured by the Employment Cost Index, has been broadly stable in recent quarters, and was 2.3% in 2016 Q4.

Quarterly US GDP growth is projected to pick up to 0.6% in 2017 Q1 (Table 1.C), broadly consistent with the strength in survey indicators of output growth (Chart 1.2) as well as measures of consumer and business sentiment, which have risen sharply (Chart 1.8). Growth should also be supported by a pickup in productivity growth and by fiscal stimulus in coming years. But higher market interest rates and the stronger dollar are likely to offset some of that support. In addition, there is considerable uncertainty over the size and composition of any fiscal stimulus, and over the policies of the new administration more broadly (Section 5).

## 1.2 Developments in the euro area

Government bond yields in the euro area have risen alongside those in the United States. Ten-year German government bond yields, for instance, have risen by 0.4 percentage points since the November Report, around half of the increase in the United States (Chart 1.1). While that rise is likely in part to reflect greater near-term momentum in euro-area activity growth (Chart 1.2), it is also likely to reflect the fact that investors see these assets as close substitutes for one another.

Government bond yields in some euro-area countries, including France, have picked up by more than those in Germany (Chart 1.9), although they remain well below levels in 2013–15. Alongside this, there has been a slight fall in the euro (Chart 1.4). Market contacts suggest that these developments largely reflect political uncertainty ahead of elections in 2017, including in France.

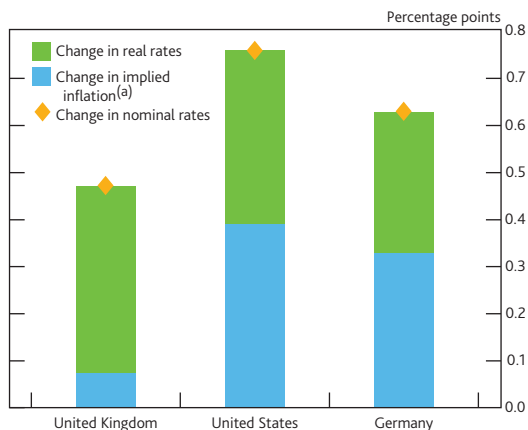
An additional factor affecting asset prices has been the European Central Bank's announcement on 8 December that it will extend its asset purchase scheme to December 2017, albeit with the rate of purchases reduced from €80 billion per month to €60 billion per month from April. While the path for short-term interest rates has shifted up since November, it remains very low (Chart 1.3).

The easing in monetary policy in the euro area over the past few years has reduced the interest rates facing households and companies, and so has been one factor supporting GDP growth. Quarterly GDP growth rose to 0.5% in 2016 Q4, from 0.4% in Q3 (Table 1.A), higher than expected at the time of the November Report and slightly higher than average growth in recent years.



### Chart 1.7 Long-term implied future inflation rates have picked up in the United States and Germany

Decomposition of changes in five-year, five-year forward nominal interest rates since the November *Report* into implied inflation and real rates

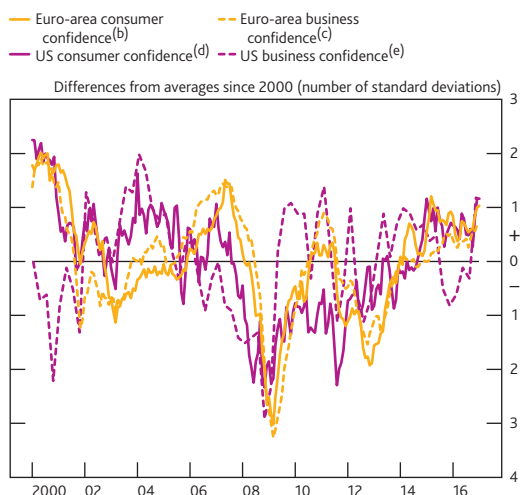


Sources: Bloomberg and Bank calculations.

(a) UK and German series are derived from interest rate swaps. US series is derived from breakeven inflation implied by nominal and inflation-protected treasury bonds. The instruments used are linked to RPI for the United Kingdom, CPI for the United States and euro-area HICP for Germany.

### Chart 1.8 Measures of confidence have increased sharply in the euro area and United States

Euro-area and US consumer and business confidence<sup>(a)</sup>



Sources: European Commission, The Conference Board, Thomson Reuters Datastream, University of Michigan and Bank calculations.

- (a) Monthly data unless stated.  
 (b) Overall EC consumer confidence indicator. Last data point is the flash estimate for January 2017.  
 (c) Headline EC sentiment index, reweighted to exclude consumer confidence. Average of overall confidence in the industrial (50%), services (38%), retail trade (6%) and construction (6%) sectors. Last data point is December 2016.  
 (d) University of Michigan consumer sentiment index. Data are non seasonally adjusted. Last data point is January 2017.  
 (e) The Conference Board measure of CEO confidence™, © 2017 The Conference Board. Content reproduced with permission. All rights reserved. Data are quarterly and non seasonally adjusted. Last data point is 2016 Q4.

The overall extent of slack — the balance between demand and potential supply — remaining in the euro area is likely to be fairly large. A key element of that is slack in the labour market. Employment growth has picked up to around its past average rate (Chart 1.10) and the unemployment rate has fallen from 12% three years ago to 9.6% in December 2016. That suggests that the degree of labour market slack has narrowed. Nevertheless, four-quarter euro-area wage growth has remained weak, at 1.3% in 2016 Q3, suggesting that there may be additional slack remaining in other aspects of the labour market. For instance, having fallen sharply during the crisis, average hours worked have not recovered.

The persistent weakness in wage growth, and thus subdued labour cost growth for firms, has been one factor behind the continued low rate of inflation in the euro area. Both headline and core inflation remain below past averages (Table 1.B). Headline inflation has, though, picked up sharply in recent months, to 1.8% in January. That largely reflects the diminishing drag from past falls in commodity prices, and recent commodity price increases feeding through.

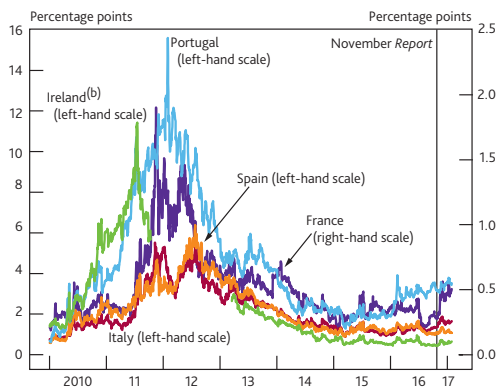
In the near term, quarterly euro-area GDP growth is projected to remain at around ½% (Table 1.C), stronger than projected in November. That is broadly consistent with the strength in the composite PMI indicator of output growth (Chart 1.2), as well as in survey measures of consumer and business confidence, which have picked up sharply (Chart 1.8). Activity is expected to continue to be supported by monetary policy, as well as by a somewhat more expansionary fiscal stance and stronger global demand for exports than at the time of the November *Report*. Recent rises in longer-term interest rates are likely to offset that support to some degree, however.

## 1.3 Developments in emerging markets

Four-quarter growth in China has been stable in recent quarters and was 6.8% in 2016 Q4 (Table 1.A). Indicators of activity point to continued robust growth in the near term. But, as discussed in the November 2016 *Financial Stability Report*, domestic demand growth appears to have become increasingly underpinned by credit growth. That poses risks to the medium-term sustainability of the pace of GDP growth and the Chinese authorities' attempts to rebalance the economy towards domestic demand. Annual growth in total social financing — a broad measure of private sector credit provision — was 13% in December, and the non-financial sector debt to GDP ratio was estimated by the Institute of International Finance (IIF) to be 255% in Q3, around 100 percentage points higher than in 2008. Financial conditions have, however, tightened slightly since the November *Report*, with rises in short-term interest rates. And annual house price inflation, while remaining rapid, slowed slightly in December. But inflationary pressures more broadly

### Chart 1.9 Long-term interest rates have risen by more in some euro-area countries than others

Selected euro-area ten-year government bond spreads over German yields<sup>(a)</sup>

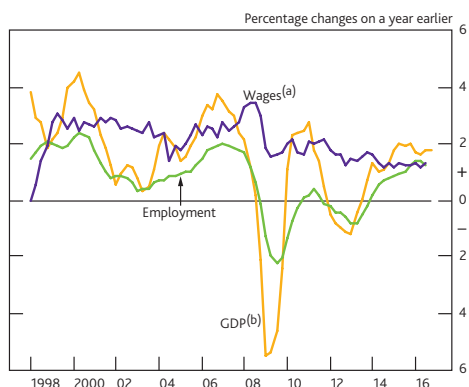


Source: Bloomberg.

- (a) Yields to maturity on ten-year benchmark government bonds, less German yields.  
 (b) Bloomberg data on Irish yields are not available between early October 2011 and mid-March 2013.

### Chart 1.10 Euro-area employment growth has recovered but wage growth remains weak

Euro-area GDP, employment and wages

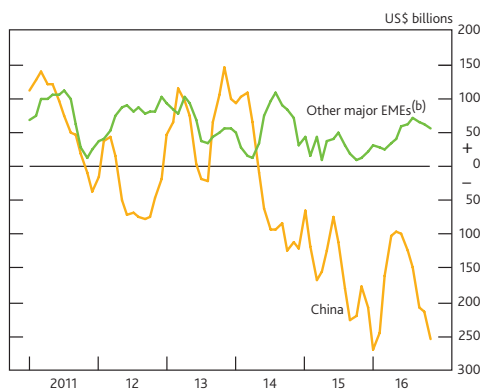


Source: Eurostat.

- (a) Compensation per employee.  
 (b) Last data point is the flash estimate for 2016 Q4.

### Chart 1.11 Net capital outflows from China have increased again

Net private sector capital flows into China and other major EMEs<sup>(a)</sup>



Sources: Institute of International Finance and Bank calculations.

- (a) Three-month moving sum. Private sector capital inflows less capital outflows, excluding changes in reserves and including errors and omissions. Data to November 2016.  
 (b) Includes Brazil, Chile, India, Indonesia, Mexico, Poland, Russia, South Africa and Turkey.

in China appear to have risen, with a sharp pickup in producer price index inflation to 5.5% in December.

An acceleration in capital outflows from China could pose a risk to domestic demand and financial conditions. Data from the IIF indicate that following an easing in net private sector capital outflows from China in 2016 H1, they accelerated again in H2 (**Chart 1.11**). Since November, the renminbi has fallen against the dollar, despite intervention by the authorities and some decline in official foreign exchange reserves. In response, the authorities have placed restrictions on domestic households' and corporates' overseas transfers and investments.

Having slowed significantly in recent years, GDP growth in other emerging market economies (EMEs) has been broadly stable since the *November Report*. In particular, Russia and Brazil, which have accounted for much of the slowing in recent years, appear to be emerging from recession. Growth in many EMEs has also been supported by an easing in financial conditions since early 2016 and, for some, the rise in commodity prices (Section 4). Furthermore, many EMEs have reduced their reliance on external finance, with current account deficits falling.

These factors, together with stronger global demand, mean that overall EME growth in the near term is projected to pick up modestly. But downside risks to the outlook remain, particularly related to credit growth in China. Furthermore, debt levels in EMEs more broadly remain high and issuance of dollar-denominated debt has increased among some EMEs in recent years. The rise in US interest rates and falls in EME currencies against the dollar (**Chart 1.4**) will have increased the domestic currency cost of servicing that debt, which could exert a further drag on EME activity.

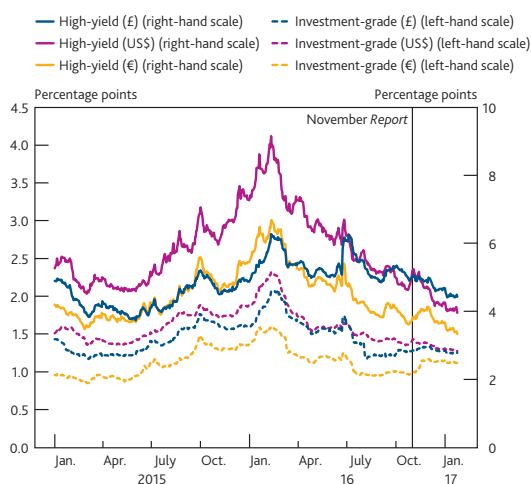
## 1.4 Developments in sterling financial markets and credit conditions

### Exchange rates

Global developments are one influence on UK asset prices, but asset prices will also reflect domestic developments. Sterling has been volatile and in the run-up to the *February Report* it was 3% higher than at the time of the *November Report* (**Chart 1.4**). Market intelligence and event studies suggest that sterling has been sensitive to changing perceptions of the United Kingdom's future trading relationships following Brexit and their implications for the economy. Implied volatilities from sterling options prices — a market-based measure of perceived risk — continue to point to a heightened degree of uncertainty around the outlook for sterling.

**Table 1.C** Monitoring the MPC's key judgements

Developments anticipated in November during 2016 Q4–2017 Q2	Developments now anticipated during 2017 Q1–Q3
<b>Advanced economies</b>	<b>Revised up</b>
<ul style="list-style-type: none"> <li>Quarterly euro-area growth to average between ¼% and ½%. Annual euro-area HICP inflation to increase to above 1% around the turn of the year.</li> <li>Quarterly US GDP growth to average a little above ½%. Annual US PCE inflation to pick up to 2%.</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly euro-area growth to average around ½%. Annual euro-area HICP inflation to be a little above 1½%.</li> <li>Quarterly US GDP growth to average a little above ½%. Annual US PCE inflation to pick up to around 2%.</li> </ul>
<b>Rest of the world</b>	<b>Broadly unchanged</b>
<ul style="list-style-type: none"> <li>Average four-quarter PPP-weighted EME growth of around 4¼%; GDP growth in China to average around 6½%.</li> </ul>	<ul style="list-style-type: none"> <li>Average four-quarter PPP-weighted EME growth of around 4¼%; GDP growth in China to average around 6½%.</li> </ul>
<b>The exchange rate</b>	<b>Higher than expected</b>
<ul style="list-style-type: none"> <li>Sterling ERI to evolve in line with the conditioning assumption.</li> </ul>	<ul style="list-style-type: none"> <li>The sterling ERI is 3% higher. Sterling ERI to evolve in line with the conditioning assumption.</li> </ul>
<b>Cost of credit</b>	<b>Revised down slightly</b>
<ul style="list-style-type: none"> <li>Corporate and household credit spreads to remain broadly flat.</li> </ul>	<ul style="list-style-type: none"> <li>Credit spreads fell slightly in 2016 Q4. They are expected to be broadly flat in coming quarters.</li> </ul>

**Chart 1.12** The additional cost of financing for riskier 'high-yield' companies has continued to fallInternational non-financial corporate bond spreads<sup>(a)</sup>

Sources: Bank of America Merrill Lynch Global Research, Thomson Reuters Datastream and Bank calculations.

(a) Option-adjusted spreads on government bond yields. Investment-grade bond yields are calculated using an index of bonds with a rating of BBB3 or above. High-yield corporate bond yields are calculated using aggregate indices of bonds rated lower than BBB3. Due to monthly index rebalancing, movements in yields at the end of each month might reflect changes in the population of securities within the indices.

**Table 1.D** Net finance raised by UK companies was lower in Q4Net external finance raised by UK private non-financial corporations<sup>(a)</sup>

£ billions	Quarterly averages				2016	
	2003–08	2009–12	2013–14	2015–16 H1	Q3	Q4
Loans	11.6	-6.2	-1.5	3.0	1.4	3.1
Bonds <sup>(b)(c)</sup>	2.9	3.3	3.1	3.8	6.1	0.1
Equities <sup>(b)</sup>	-2.1	1.3	0.2	1.0	0.3	2.1
Commercial paper <sup>(b)</sup>	0.0	-0.4	-0.3	0.8	-3.3	1.1
<b>Total<sup>(d)</sup></b>	<b>12.9</b>	<b>-1.9</b>	<b>1.6</b>	<b>7.6</b>	<b>7.0</b>	<b>5.5</b>

(a) Includes sterling and foreign currency funds from UK monetary financial institutions and capital markets.

(b) Non seasonally adjusted.

(c) Includes stand-alone and programme bonds.

(d) As component series are not all seasonally adjusted, the total may not equal the sum of its components.

## Interest rates

The market-implied path for UK short-term interest rates has risen slightly (**Chart 1.3**). Market contacts ascribe that rise, in part, to recent robust UK macroeconomic data (Section 2). They also cite the change in the MPC's communications in November — in particular that 'monetary policy can respond in either direction'. The MPC voted to make no changes to monetary policy at its December meeting, as set out in the box on page 7. The details of the February decision are contained in the Monetary Policy Summary on pages i–ii of this *Report*, and in more detail in the Minutes of the meeting.

Longer-term UK interest rates have also risen (**Chart 1.1**). While the moves have been smaller than those in the United States, the increase in UK long-term forward rates similarly appears to be accounted for mostly by an increase in term premia (**Chart 1.6**). That could reflect the perceived reduction in the risk of a prolonged period of weak global GDP growth (Section 1.1) and the interconnectedness of global financial markets; investors tend to see advanced-economy government bond yields as close substitutes.

In contrast to the United States and euro area, however, the inflation compensation component of long-term forward interest rates — one measure of long-term inflation expectations — has been broadly stable since November (**Chart 1.7**) at around its past average rate, although it is higher than at the time of the *August Report*. The box on pages 30–31 discusses developments in indicators of UK inflation expectations in more detail.

## Corporate capital markets

UK equity prices have increased since the *November Report*, with the FTSE All-Share index 3% higher (**Chart 1.5**). That is in part likely to reflect a reduction in risk premia, as well as a small upward revision to expected corporate earnings, in response to higher expected global and domestic growth.

The cost of issuing corporate bonds for companies will reflect government bond yields (**Chart 1.1**), as well as the additional compensation or 'spread' that investors require for the relative riskiness of the company. The spreads on investment-grade sterling corporate bonds have been broadly stable since the *November Report* (**Chart 1.12**), and so the rise in government bond yields will have pushed up the cost of corporate bond finance for these companies. But the spreads on 'high-yield' bonds, those issued by riskier companies with lower credit ratings, have fallen by more than the rise in government bond yields, lowering the cost of debt for these companies. Those falls have occurred alongside similar falls in high-yield spreads in other advanced economies and market contacts suggest that this reflects the improved outlook for global growth.

Alongside its support for domestic financial conditions more broadly, the MPC's package of policy measures announced in

## Monetary policy since the November Report

The MPC's central projection in the *November Report* was that GDP was likely to grow at a moderate pace in the near term, but then slow from the start of 2017, averaging 1½% over 2017–19. That reflected the anticipated impact of lower real income growth on household spending, and uncertainty over future trading arrangements that could restrain business activity and supply growth over a protracted period. Largely due to the depreciation in sterling, CPI inflation was expected to rise above the 2% target during 2017 H1 and to reach around 2¾% in 2018, before falling back gradually. That central projection was conditioned on: the path for Bank Rate implied by market interest rates; the announced Term Funding Scheme; and the stock of purchased gilts and corporate bonds reaching £435 billion and up to £10 billion respectively and remaining there throughout the forecast period. The last three elements would be financed by the issuance of central bank reserves.

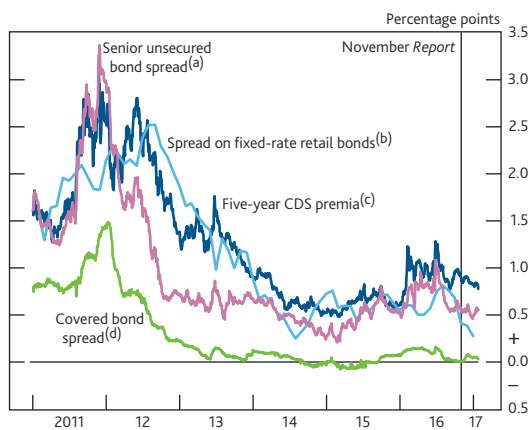
At its meeting ending on 14 December, the MPC noted there had been little news in the domestic activity data since the *November Report*, and a slowing in UK growth remained likely

during 2017. Although the near-term global outlook had improved, in part reflecting expectations following the US election of looser fiscal policy there, this was counterbalanced by more elevated risks, which partly related to the increased vulnerability in China to capital outflows.

CPI inflation had risen to 1.2% in November, and the Committee expected inflation to rise to the 2% target within six months, boosted in part by the rise in oil prices. The sterling exchange rate had appreciated since the time of the *November Report* and this by itself would point to less of an overshoot in inflation relative to target in the medium term than incorporated in the *November* projections. However, month-to-month volatility in the exchange rate was to be expected.

All Committee members judged it appropriate to leave the stance of monetary policy unchanged. The MPC noted that the path of monetary policy would continue to depend on the evolution of prospects for demand, supply, the exchange rate and therefore inflation. As a result, monetary policy could move in either direction to ensure a sustainable return of CPI inflation to the 2% target.

**Chart 1.13 UK bank funding spreads have fallen slightly**  
UK banks' indicative longer-term funding spreads



Sources: Bank of England, Bloomberg, IHS Markit and Bank calculations.

- Constant-maturity unweighted average of secondary market spreads to mid-swaps for the major UK lenders' five-year euro-denominated senior unsecured bonds or a suitable proxy when unavailable.
- Unweighted average of spreads for two-year and three-year sterling fixed-rate retail bonds over equivalent-maturity swaps. Bond rates are end-month rates and swap rates are monthly averages of daily rates.
- Unweighted average of five-year euro-denominated senior CDS premia for the major UK lenders.
- Constant-maturity unweighted average of secondary market spreads to swaps for the major UK lenders' five-year euro-denominated covered bonds or a suitable proxy when unavailable.

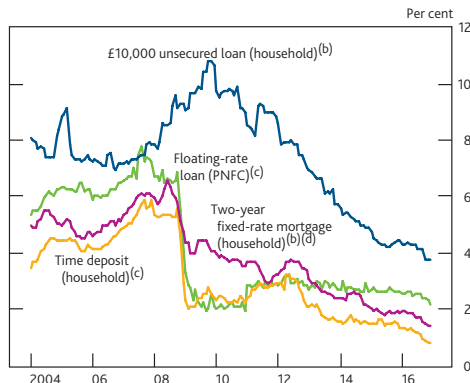
August is likely to have led to a slightly lower cost of capital market finance for companies than would otherwise have been the case. Under the Corporate Bond Purchase Scheme (CBPS), the Bank has so far purchased £5.8 billion of corporate bonds, and intends to purchase up to a further £4.2 billion. According to some market contacts, the Scheme contributed to a sharp pickup in corporate bond issuance in September. Issuance has since fallen back somewhat, with market contacts attributing that to the recent rise in longer-term interest rates. Accordingly, overall net external finance raised by companies in 2016 Q4 was lower than in Q3 (Table 1.D).

### Bank funding costs and credit conditions

Capital markets also matter for broader credit conditions in the economy through their influence on bank funding costs. There has been a slight fall since November in the spread that banks pay for funding over and above benchmark interest rates (Chart 1.13). Some lenders have reported that the Term Funding Scheme, by providing funding at close to Bank Rate, may have contributed to the recent fall in funding spreads. Benchmark interest rates, however, have risen since the *November Report* by more than the fall in funding spreads. And so, overall, there has been a slight increase in the cost of bank funding since November, partially unwinding falls in bank funding costs in previous quarters.

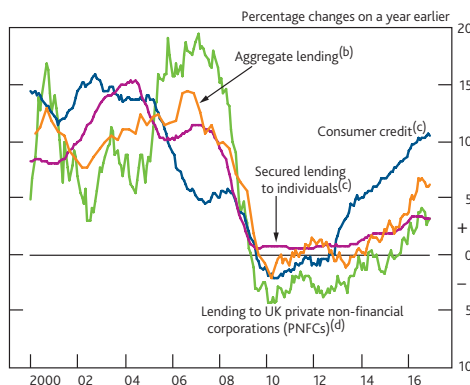
In response to the past falls in bank funding costs, the interest rates on bank deposits and lending for households and companies have fallen further over recent quarters

**Chart 1.14 Borrowing and deposit rates facing households and companies have fallen further**  
Average interest rates on new lending and deposits<sup>(a)</sup>



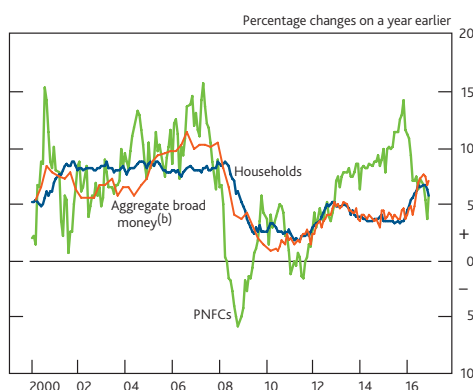
- (a) The Bank's quoted and effective interest rate series are currently compiled using data from up to 19 UK monetary financial institutions. Data are non seasonally adjusted.  
(b) Sterling-only end-month quoted rates.  
(c) Sterling-only average monthly effective rates.  
(d) On mortgages with a loan to value ratio of 75%.

**Chart 1.15 Lending growth has risen in recent years**  
Aggregate and sectoral lending<sup>(a)</sup>



- (a) Monthly data unless otherwise specified.  
(b) M4 lending (excluding securitisations), excluding borrowing by intermediate other financial corporations (OFCs). Intermediate OFCs are: mortgage and housing credit corporations; non-bank credit grantors; bank holding companies; securitisation special purpose vehicles; other activities auxiliary to financial intermediation; and 'other financial intermediaries' belonging to the same financial group. Quarterly data prior to June 2010 and monthly thereafter.  
(c) Sterling net lending by UK monetary financial institutions (MFIs) and other lenders. Consumer credit consists of credit card lending and other unsecured lending (other loans and advances) and excludes student loans.  
(d) Sterling net lending by UK MFIs.

**Chart 1.16 Broad money growth, having picked up earlier in 2016, has slowed since September**  
Aggregate and sectoral broad money<sup>(a)</sup>



- (a) Monthly data unless otherwise specified.  
(b) Quarterly data prior to June 2010 and monthly thereafter. M4 excluding intermediate OFCs (see footnote (b) of Chart 1.15 for definition of intermediate OFCs).

(Chart 1.14). As recent increases in bank funding costs are passed through, however, there is expected to be a gradual increase in retail interest rates on lending to households and companies.

Annual growth in aggregate lending has picked up steadily in recent years (Chart 1.15). That in part reflects stronger demand for credit, with lending growth in recent months also likely to have been supported by the falls in interest rates since the summer. Within aggregate lending, annual growth in lending to companies has been broadly stable over 2016 at around 3%, having increased in preceding years. Corporate credit availability remains above normal according to intelligence gathered by the Bank's Agents. But there are some signs from discussions with lenders that availability may have tightened slightly for some sectors, such as commercial real estate, while the *Credit Conditions Survey* suggests that corporate credit demand has weakened. Growth in secured lending to households has also stabilised over the past year, as housing market activity has been subdued (Section 2).

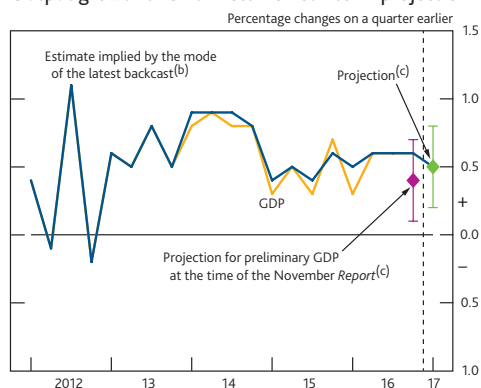
There has, however, been a particularly robust recovery in annual consumer credit growth, which reached 10.6% in December (Section 2). Growth in consumer credit has become more broad-based over the past year, having previously been concentrated in dealership car finance. As well as robust demand, the rapid growth in consumer credit is likely to reflect strong competition, including on both price and non-price terms. For example, the average interest rate on a £10,000 unsecured loan fell to 3.8% in December (Chart 1.14). And there has been a marked lengthening in interest-free periods on credit card balance transfers in recent years.

As the main source of money creation, the pickup in credit growth over recent years is likely to have contributed to the rise in aggregate broad money growth (Chart 1.16). Broad money growth can provide a signal of future growth in spending in the economy. But as discussed in the *November Report*, the pickup in household money growth in Summer 2016 occurred alongside a reduction in investment fund holdings and so appeared to reflect a desire among households to hold more liquid assets in the face of heightened uncertainty around the time of the referendum. Since November, growth in household money has slowed, as flows into investment funds have recovered. Growth in corporate money holdings has also eased over recent quarters. That is likely to reflect a normalisation following a period of strong growth between 2013 and early 2016.

## 2 Demand and output

Output growth has been stable during 2016 at close to past average rates. Underpinning that, consumption growth has been robust, though it is expected to slow as the rise in import prices weighs on households' purchasing power. Activity in the housing market has picked up slightly but remains subdued. In contrast, investment has declined over the past year and, despite the depreciation in sterling, net trade has dragged on GDP growth.

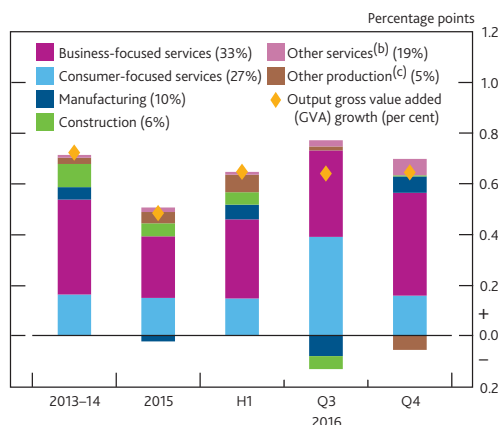
**Chart 2.1** GDP growth has been broadly stable in 2016  
Output growth and Bank staff's near-term projection<sup>(a)</sup>



Sources: ONS and Bank calculations.

- (a) Chained-volume measures. GDP is at market prices.  
 (b) The latest backcast, shown to the left of the vertical line, is a judgement about the path for GDP in the mature estimate of the data. The observation for 2017 Q1, to the right of the vertical line, is consistent with the MPC's central projection.  
 (c) The magenta diamond shows Bank staff's central projection for the preliminary estimate of GDP growth in 2016 Q4 at the time of the November Report. The green diamond shows the current staff projection for the preliminary estimate of GDP growth in 2017 Q1. The bands on either side of the diamonds show uncertainty around those projections based on one root mean squared error of past Bank staff forecasts for quarterly GDP growth made since 2004.

**Chart 2.2** Service sector output growth remains robust  
Contributions to average quarterly GVA growth by output sector<sup>(a)</sup>



Sources: ONS and Bank calculations.

- (a) Chained-volume measures at basic prices. Contributions may not sum to the total due to rounding. Service industries are defined as 'consumer-focused' if the share of their output that is directly consumed exceeds the share of output that is sold to other businesses to be used as intermediate inputs, while the reverse is true for 'business-focused' service sectors. Calculated using the *United Kingdom Input-Output Analytical Tables 2010*. Figures in parentheses are weights in nominal GDP in 2013.  
 (b) Other services includes: public administration and defence; health services and education.  
 (c) Other production includes: utilities; extraction and agriculture.

Growth in demand relative to potential supply (Section 3) is an important determinant of inflationary pressure. Since the vote to leave the European Union, a key issue continues to be how much and how quickly demand and supply will be affected by the process of Brexit. This section examines the outlook for demand growth, drawing on the official output and expenditure data and other indicators of activity and spending.

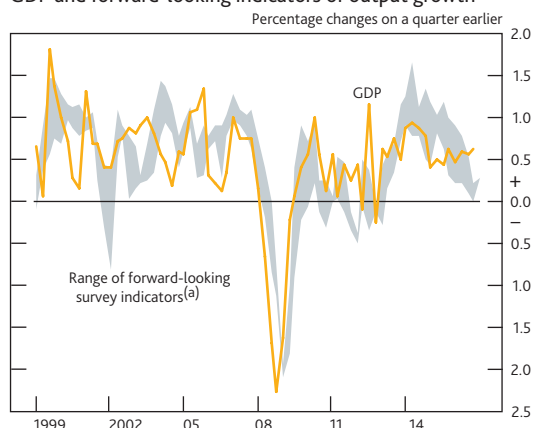
Quarterly GDP growth was stable over 2016 (Chart 2.1). Output growth, according to the preliminary estimate, was 0.6% in 2016 Q4, the same as in Q3, and growth is expected to be unrevised in the mature estimate. Growth in Q4 continued to be driven mainly by activity in the service sectors (Chart 2.2). While growth in consumer-focused service output slowed, it was around its average pace over the past two years, which is likely to have been associated with continued robust growth in household spending (Section 2.1). A fall in extraction output, reflecting the timing of maintenance activity, weighed on growth in Q4. Excluding extraction, output growth was slightly stronger than in Q3.

Output growth is projected to slow slightly to 0.5% in 2017 Q1. While survey indicators of expected output growth have risen slightly, their levels remain consistent with a lower rate of GDP growth in Q1 than reported by the official data for 2016 Q4 (Chart 2.3).

GDP growth has been markedly stronger since the middle of 2016 than projected in August, and stronger still than the contraction in activity suggested by output indicators at the time. Underpinning that, consumption growth appears to have been robust. It is projected to slow in response to the drag from higher import prices on households' purchasing power, though more gradually than previously projected (Section 2.1). Housing market activity and housing investment growth have been more resilient than expected, though still subdued (Section 2.2). According to the latest data, business investment growth has been weak, albeit somewhat less so than expected, and it is projected to fall slightly in the near

**Chart 2.3 Survey measures of expected output growth point to slower GDP growth**

GDP and forward-looking indicators of output growth



Sources: BCC, CBI, IHS Markit and Bank calculations.

(a) Range includes CBI, Markit/CIPS and BCC measures of expected output. Data for services, construction and manufacturing for Markit/CIPS, services and non-services for BCC, and manufacturing, business/consumer/professional services and distributive trades for CBI. Weighted together using output shares. Markit/CIPS measure uses the end-quarter observation of monthly data and is the net percentage balance of companies reporting they expect business activity to rise over the next year (services and construction) or that new orders have increased over the month (manufacturing). BCC data are quarterly and non seasonally adjusted and show the percentage balance of respondents reporting they expect turnover to increase in the next year. CBI measure uses net percentage balance of respondents reporting they expect output/business/sales to increase in the next three months for manufacturing and business/consumer/professional services, and next month for distributive trade sectors; quarterly average of monthly data. Survey measures are mean-variance adjusted to match quarterly GDP growth and are shown with a one-quarter lead.

**Table 2.A Domestic demand growth remained robust in Q3**

Expenditure components of demand<sup>(a)</sup>

Percentage changes on a quarter earlier

	Averages						
	1998– 2007	2008– 09	2010– 12	2013– 14	2015	2016 H1	2016 Q3
Household consumption <sup>(b)</sup>	0.9	-0.6	0.2	0.5	0.7	0.8	0.7
Private sector investment	0.7	-4.4	1.6	1.1	0.8	0.1	0.2
of which, business investment <sup>(c)</sup>	0.6	-3.0	1.9	0.8	0.5	-0.1	0.4
of which, private sector housing investment	0.8	-7.4	0.8	2.8	1.7	0.5	-0.2
<b>Private sector final domestic demand</b>	<b>0.8</b>	<b>-1.3</b>	<b>0.6</b>	<b>0.7</b>	<b>0.7</b>	<b>0.6</b>	<b>0.6</b>
Government consumption and investment <sup>(c)</sup>	0.8	0.9	-0.1	0.4	0.3	0.3	0.5
<b>Final domestic demand</b>	<b>0.8</b>	<b>-0.8</b>	<b>0.4</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>
Change in inventories <sup>(d)(e)</sup>	0.0	0.2	0.0	0.0	-0.2	0.1	-0.5
Alignment adjustment <sup>(e)</sup>	0.0	-0.1	0.0	0.1	-0.1	-0.2	0.7
<b>Domestic demand<sup>(f)</sup></b>	<b>0.8</b>	<b>-0.8</b>	<b>0.4</b>	<b>0.8</b>	<b>0.1</b>	<b>0.6</b>	<b>1.8</b>
'Economic' exports <sup>(g)</sup>	1.2	-1.1	0.7	0.8	1.9	-0.7	-2.6
'Economic' imports <sup>(g)</sup>	1.4	-1.2	0.8	1.1	1.1	0.3	1.4
<b>Net trade<sup>(e)(g)</sup></b>	<b>-0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>-0.1</b>	<b>0.2</b>	<b>-0.3</b>	<b>-1.2</b>
<b>Real GDP at market prices</b>	<b>0.7</b>	<b>-0.7</b>	<b>0.4</b>	<b>0.7</b>	<b>0.4</b>	<b>0.5</b>	<b>0.6</b>
Memo: nominal GDP at market prices	1.2	-0.2	0.9	1.0	0.5	1.4	0.8

(a) Chained-volume measures unless otherwise stated.

(b) Includes non-profit institutions serving households.

(c) Investment data take account of the transfer of nuclear reactors from the public corporation sector to central government in 2005 Q2.

(d) Excludes the alignment adjustment.

(e) Percentage point contributions to quarterly growth of real GDP.

(f) Includes acquisitions less disposals of valuables.

(g) Excluding the impact of missing trader intra-community (MTIC) fraud.

term (Section 2.4). Net trade is expected to support growth in the near term, reflecting the 18% depreciation in sterling since November 2015 (Section 2.5).

## 2.1 Household spending

Consumption has continued to grow at a robust pace, as it has done over the past two years (Table 2.A). This was broadly as projected in November but slightly stronger than expected in August. There is little sign of uncertainty having weighed on consumption growth since the referendum.

Consumption is mainly determined by trends in income and income expectations. While wage growth has been subdued, increases in employment (Section 3) have pushed up aggregate income growth in recent years. Households' purchasing power has also been boosted by falls in food and energy prices. Real income has grown broadly in line with past averages since 2015, though it slowed slightly in 2016 Q3 as the effect of those past falls in food and energy prices has started to fade (Chart 2.4).

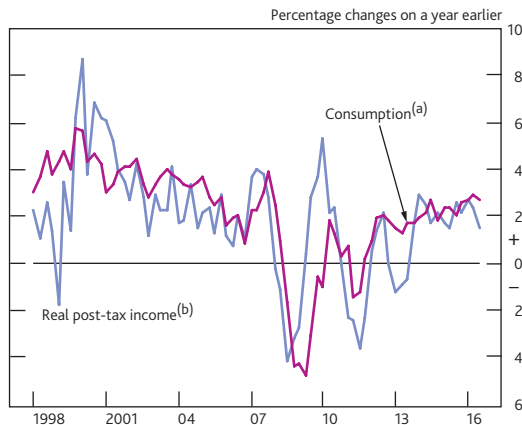
After strong growth in 2015 and 2016, quarterly growth in real labour income is projected to slow to around zero this year (Section 5), as higher import prices pass through to higher consumer prices (Section 4). There are signs that households are starting to anticipate this effect. For example, the GfK/EC measure of households' expected price increases has risen (Chart 2.5). Despite this, households' expectations of their financial situation according to the same GfK/EC survey has only softened slightly, except for a brief period around the referendum, and remains above its past average. In addition to strong income growth, confidence may have been supported by rising asset prices over recent years (Section 1).

Consumption has grown somewhat faster than income in recent quarters and, consistent with that, the saving ratio has declined slightly (Chart 2.6). There is uncertainty about the timing and extent to which consumption growth will respond to the slowing in real income growth. One factor that affects households' decisions to save or spend out of their income is their expectations for future income growth. For example, if households expect the slowing in real income growth to be temporary, they may choose to reduce their saving temporarily rather than their spending growth.

Another factor that can influence household spending and saving decisions is the availability and cost of credit. Although as a proportion of consumption it remains small, consumer credit growth has risen in recent years (Chart 2.7). Much of that has been accounted for by growth in dealership car finance. This is likely to have mainly reflected a shift in the availability of dealership car finance and how households buy

### Chart 2.4 Real income growth has supported consumption growth

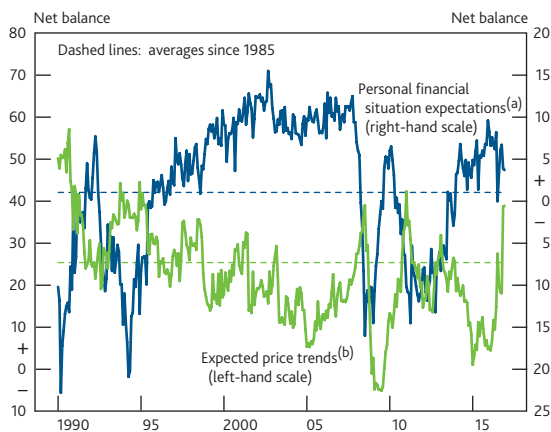
Household income and consumption



(a) Chained-volume measure. Includes non-profit institutions serving households.  
(b) Total available household resources divided by the consumer expenditure deflator.

### Chart 2.5 Consumer confidence has softened slightly as price expectations have risen

GfK/EC survey measures of consumer expectations



Source: GfK (research carried out on behalf of the European Commission).

(a) Net balance of respondents reporting that they expect their personal financial situation to improve over the next twelve months. Last data point shown is December 2016.  
(b) Net balance of respondents expecting inflation to rise over the next year. Last data point shown is December 2016.

### Chart 2.6 The saving ratio has declined modestly in recent years

Household saving



(a) Saving as a percentage of household post-tax income.  
(b) Saving as a percentage of household post-tax income excluding flows into employment-related pension schemes.

cars.<sup>(1)</sup> Around four fifths of new cars were bought with dealership finance in 2015, compared with half in 2009. At least some of that is likely to have replaced other forms of finance that would have otherwise been used to buy cars, such as unsecured loans or savings, rather than leading to additional car purchases. It is also likely to have represented an easing in credit conditions and therefore supported spending to some degree. As much of that shift in the way car purchases are financed has now occurred, the strong contribution from dealership finance to consumer credit growth is expected to decline.

The most recent pickup in consumer credit growth has reflected growth in credit card and other borrowing, such as personal loans (Chart 2.7). That has occurred alongside marked falls in interest rates on household borrowing in recent years (Chart 1.14) and a lengthening in interest-free periods on credit card balance transfers. While some of the increase in borrowing may be matched by increased saving, the easing in credit conditions is likely to have supported consumption growth in recent years. And credit conditions are likely to continue to support consumption in coming quarters.

Overall, consumption growth is projected to slow in coming quarters, as real income growth slows. Nonetheless, households are projected to adjust their spending growth more gradually than that slowing in income growth, so that the saving ratio falls.

## 2.2 The housing market

Credit conditions and income will also affect households' decisions about whether to purchase a home. Activity in the housing market will in turn affect housing investment, which comprises three distinct components: around three quarters is spending on new dwellings and improvements to existing dwellings, with the remainder spent on services associated with property transactions, such as estate agents' fees.

Housing investment fell in 2016 Q3 (Table 2.A), driven by a fall in spending associated with transactions. This is likely to, at least in part, reflect the weakness in transactions in Q2 and Q3 (Chart 2.8). As discussed in the May 2016 Report, the pre-announced rise in stamp duty land tax in April 2016 led some transactions that would otherwise have taken place later in the year to be brought forward. That resulted in a sharp rise in transactions in Q1 and a subsequent fall in April.

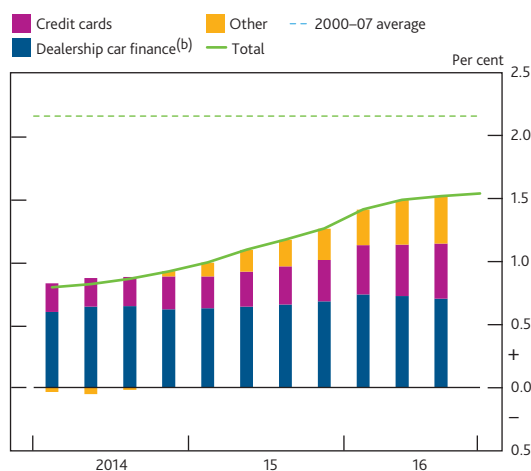
Transactions have risen from their April low (Chart 2.8) and, while housing market activity remains subdued, it has been somewhat stronger than expected in November. House price inflation also picked up in Q4, having slowed over much of 2016. Uncertainty around the impact of Brexit on housing

(1) For more information see the box on pages 12–13 of the 2016 Q3 Credit Conditions Review; [www.bankofengland.co.uk/publications/Documents/creditconditionsreview/2016/ccrq316.pdf](http://www.bankofengland.co.uk/publications/Documents/creditconditionsreview/2016/ccrq316.pdf).



### Chart 2.7 Consumer credit growth has continued to pick up

Net four-quarter change in consumer credit as a share of consumption<sup>(a)</sup>

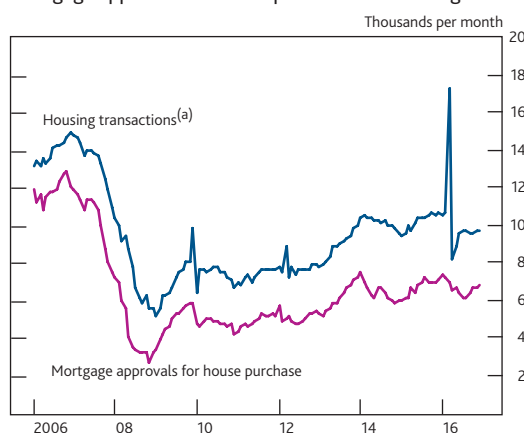


Sources: Bank of England, Finance & Leasing Association, ONS and Bank calculations.

- (a) Four-quarter net flow of consumer credit divided by four-quarter nominal household consumption. Data are non seasonally adjusted sterling net lending by UK MFIs and other lenders to UK individuals excluding student loans.
- (b) Dealership car finance lending is estimated using the change in outstanding stock and it may therefore reflect breaks in the series. Data are not yet available for 2016 Q4.

### Chart 2.8 Housing market activity has risen slightly

Mortgage approvals for house purchase and housing transactions



Sources: Bank of England and HM Revenue and Customs.

- (a) Number of residential property transactions for values of £40,000 or above.

demand appeared to weigh on price growth initially, but this effect faded in the months following the referendum, alongside the recovery in consumer confidence (Chart 2.5). The average of the Halifax and Nationwide house price indices rose by 6.6% on an annualised basis in the three months to December, having risen by 2.4% in the three months to September.

Housing market activity is projected to continue to increase gradually in the near term. Mortgage approvals, a leading indicator of transactions, have risen, and the RICS survey balance for new buyer enquiries points to a further pickup in activity.

Investment in new and existing dwellings was little changed in 2016 Q3, broadly as expected in November, and is projected to remain broadly flat in coming quarters. Overall, housing investment is projected to grow modestly in the near term, largely reflecting a rise in transaction spending (Table 2.B).

## 2.3 Business spending

In November, most survey indicators of investment intentions had declined (Chart 2.9) and measures of business uncertainty remained elevated. Business investment was, therefore, expected to have fallen (Table 2.B), but there was uncertainty about the timing and extent of that fall.

In contrast to those indicators, the official estimate of business investment rose slightly in Q3 (Table 2.A), although it remained lower than a year earlier. Early investment data are volatile and prone to significant revision.<sup>(1)</sup> Although survey indicators are informative about underlying trends, quarter-to-quarter movements, particularly in early estimates, are hard to predict.

To the extent that underlying investment has been firmer than expected, this could be due to a number of factors. The rise in uncertainty may have weighed on investment less than it has tended to in the past.<sup>(2)</sup> That could suggest a more positive outlook for investment. Or it could be that those effects are slow to influence spending, as firms take time to adjust their investment plans. The effects of uncertainty may therefore take longer to show up in investment than projected. In particular, to the extent that uncertainty relates to the long-term outlook following Brexit, investment in capacity to supply near-term demand may not have been materially affected.

Another reason uncertainty may have weighed on investment less than in the past is the stability of credit conditions. In contrast to past increases in uncertainty, which have typically

(1) See Chart 2.10 of the May 2016 Report; [www.bankofengland.co.uk/publications/Documents/inflationreport/2016/may.pdf](http://www.bankofengland.co.uk/publications/Documents/inflationreport/2016/may.pdf).

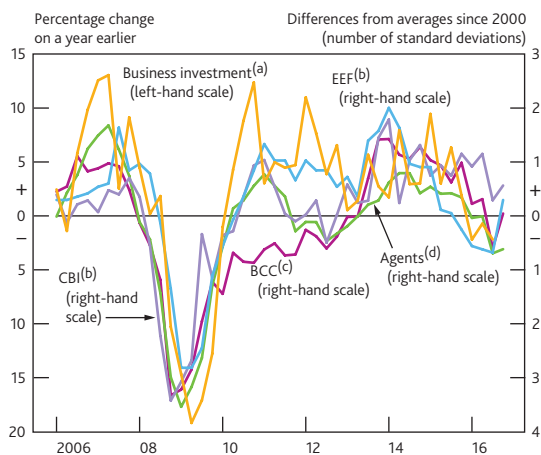
(2) For more details on the effects of different measures of uncertainty on spending, see Forbes, K (2016), 'Uncertainty about uncertainty'; [www.bankofengland.co.uk/publications/Documents/speeches/2016/speech942.pdf](http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech942.pdf).

**Table 2.B** Monitoring the MPC's key judgements

Developments anticipated in November during 2016 Q4–2017 Q2	Developments now anticipated during 2017 Q1–Q3
<b>Cost of credit</b>	<b>Revised down slightly</b>
<ul style="list-style-type: none"> <li>Corporate and household credit spreads to remain broadly flat.</li> </ul>	<ul style="list-style-type: none"> <li>Credit spreads fell slightly in 2016 Q4. They are expected to be broadly flat in the coming quarters.</li> </ul>
<b>Consumer spending</b>	<b>Revised up</b>
<ul style="list-style-type: none"> <li>Quarterly consumption growth to slow gradually to around ¼% on average.</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly consumption growth to average around ½% in 2017 H2, slowing to ¼%.</li> </ul>
<b>Housing market</b>	<b>Revised up</b>
<ul style="list-style-type: none"> <li>Mortgage approvals for house purchase expected to average around 65,000 per month.</li> <li>The average of the Halifax and Nationwide price indices to increase by ½% per quarter.</li> <li>Quarterly growth in housing investment to average 0%.</li> </ul>	<ul style="list-style-type: none"> <li>Mortgage approvals for house purchase to be around 71,000 per month, on average.</li> <li>The average of the Halifax and Nationwide price indices to increase by 1¼% per quarter, on average.</li> <li>Quarterly growth in housing investment to average ¾%.</li> </ul>
<b>Business investment</b>	<b>Revised up</b>
<ul style="list-style-type: none"> <li>Business investment to fall by around ¾% per quarter, on average.</li> </ul>	<ul style="list-style-type: none"> <li>Business investment to fall by around ¼% per quarter, on average.</li> </ul>
<b>Trade</b>	<b>Broadly unchanged</b>
<ul style="list-style-type: none"> <li>Net trade contributes positively to real GDP growth.</li> <li>The current account deficit narrows to around 5%.</li> </ul>	<ul style="list-style-type: none"> <li>Net trade provides a small boost to real GDP growth.</li> <li>The current account deficit narrows to around 4% of GDP.</li> </ul>

**Chart 2.9** Measures of investment intentions picked up in Q4

Business investment and survey indicators of investment intentions



Sources: Bank of England, BCC, CBI/PwC, EEF and Bank calculations.

- (a) Chained-volume measure. Data are to 2016 Q3 and adjust for the transfer of the nuclear reactors from the public corporation sector to central government in 2005 Q2.
- (b) EEF and CBI measures are net percentage balances of respondents reporting that they have increased planned investment in plant and machinery for the next twelve months. EEF measure corresponds to the manufacturing sector and CBI sectoral surveys are weighted together using shares in real business investment.
- (c) BCC measure is the net percentage balance of respondents reporting that they have increased planned investment in plant and machinery. Sectoral surveys are weighted together using shares in real business investment. Data are non seasonally adjusted.
- (d) Agents measure shows companies' intended changes in investment over the next twelve months, with sectoral surveys weighted together using shares in real business investment. Last observation in the quarter.

been accompanied by a marked tightening in credit conditions, these have been broadly stable (Chart 2.10 and Section 1).

Companies' spending can also be affected by developments in the commercial real estate (CRE) market in a number of ways. Investment spending on new and existing buildings and transactions are a part of business investment. Moreover, developments in the CRE market can affect business sentiment and many firms use property as collateral for borrowing. Activity in this sector was dampened, in part, by uncertainty about the outlook for CRE demand following Brexit. CRE prices and transactions fell somewhat ahead of the referendum, and then further following the vote.<sup>(1)</sup> Since then, conditions in the CRE market appear to have stabilised and, therefore, the effect of this drag on investment growth may have diminished.

A further influence on business spending could be the effect of changes in companies' defined-benefit pension fund deficits. As explained in the box on pages 14–15, however, while this may be an important influence for a small number of companies, the data examined suggest that this is unlikely to have materially affected aggregate investment growth.

Investment is projected to fall modestly in coming quarters but by less than projected in November. Survey indicators of investment intentions picked up in Q4 (Chart 2.9), but suggest that investment growth will remain subdued, especially in the service sector. Some respondents to the Bank's new Decision Maker Panel (DMP) Survey report that heightened uncertainty is weighing on their investment plans (see the box on page 16 for more information on this survey). Other surveys with a longer history, such as the *Deloitte CFO Survey*, also suggest that business uncertainty remained elevated in Q4.

## 2.4 Government spending

The MPC's forecasts are conditioned on the Government's tax and spending plans detailed in the Autumn Statement. While the Government plans to continue to reduce the budget deficit, public sector net borrowing over the next three years is projected to fall more gradually than at the time of the March 2016 *Budget*. That reflects two key factors: lower expected GDP growth, which implies higher welfare payments and lower tax receipts, and increased discretionary spending, in particular infrastructure investment.

While the MPC's forecasts in November accounted for the role of slower GDP growth, they did not include the additional measures announced. Fiscal policy is, therefore, projected to provide a boost to GDP growth over the next three years compared with the forecast in November (Section 5).

(1) For more information see the November 2016 *Financial Stability Report*; [www.bankofengland.co.uk/Pages/reader/index.aspx?pub=fsrnov16&page=9](http://www.bankofengland.co.uk/Pages/reader/index.aspx?pub=fsrnov16&page=9).

## Macroeconomic risks of defined-benefit pension fund deficits

Defined-benefit (DB) pension funds invest upfront contributions to provide pre-determined payments to employees on retirement. A pension scheme is considered to be in deficit when the value of its liabilities exceed that of its assets. To calculate the current value of those assets and liabilities, market values are typically used for assets and future expected payments are often discounted using long-term interest rates. The extent to which a scheme is in deficit is therefore sensitive to movements in those interest rates. As discussed in the box on pages 14–15 of the *November Report*, the effect of changes in interest rates on deficits will depend on how they affect asset prices compared with the estimated value of liabilities. For example, falls in interest rates associated with an easing in monetary policy will typically boost the value of both assets and liabilities and, therefore, funds starting from close to a balanced position will generally remain so.

DB pension fund deficits have widened over recent years. The proportion of employees covered by DB pension schemes has declined, however, as these schemes have generally been closed to new entrants.<sup>(1)</sup> Around 8% of private sector employees are currently members of active DB pension schemes. Many of those schemes are in relatively larger firms; fewer than 1% of UK firms have outstanding claims from active or closed DB pension schemes. While a small proportion of the total, changes in DB pension fund deficits could potentially have an impact on those companies' spending decisions or solvency, which could in principle influence aggregate business spending and the stability of credit conditions. There is evidence to suggest that changes in contributions to DB pension funds can affect the spending decisions of those companies affected. But overall, given the small proportion of firms with DB pension funds, the effect on aggregate investment growth is estimated to be very small.

On 4 January, members of the Financial Policy Committee and the Monetary Policy Committee met to discuss, and were presented with material from ongoing work on, developments in DB pension fund deficits and evidence of their potential economic impacts. This box summarises the material presented at that meeting.

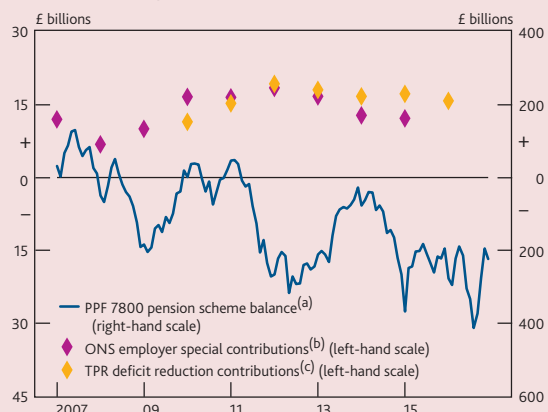
### The size and distribution of DB pension fund deficits

The most timely measure of aggregate DB pension fund deficits is the monthly series published by the Pension Protection Fund (PPF) — the PPF 7800 Index. On this measure, deficits have narrowed notably in recent months but remain wider than in the past (**Chart A**). While this measure is timely it has some limitations. For example, the PPF 7800 does not account for firms' contributions to their pension schemes during the year or for some hedging activity. These

factors can lead to volatility in the series and revisions once asset allocation data are updated each year. Moreover, the measure of liabilities only reflects the PPF's obligations to pay out in the event of employer insolvency. The PPF pays 100% of pensions that are already being received or where members have reached retirement age and up to 90% in other cases.

### Chart A Defined-benefit pension deficits have widened over the past decade

The balance on UK DB pension funds and companies' contributions to pension funds



Sources: ONS, Pension Protection Fund (PPF) and The Pensions Regulator (TPR).

(a) Calculated on an s179 basis.

(b) Annual data. ONS data on employer special contributions to pension funds.

(c) Annual data. 2010 figure was estimated from an incomplete sample and does not include data for all schemes in this period. 2015 and 2016 figures are provisional estimates and subject to revision.

The Pensions Regulator (TPR) assesses pension schemes at least once every three years. Where a scheme is estimated to be in deficit, a deficit reduction plan to close that gap will be agreed with the firm. Despite the widening in deficits indicated by the PPF 7800, contributions made by companies as part of those deficit reduction plans and any additional contributions more broadly have both been fairly stable in recent years (**Chart A**).

Scheme-level data from TPR provide information on the distribution of pension deficits across firms.<sup>(2)</sup> These data show that pension deficits are concentrated among large corporates, which account for three quarters of the total (**Chart B**). But, for many of these large firms, pension deficits are small relative to their assets.

### Impact of DB pension deficits on investment

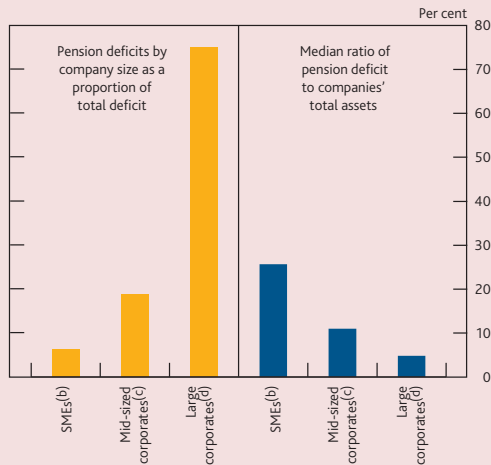
One way pension deficits might affect the wider economy is if firms reduce their investment spending in order to increase their pension contributions. Bank staff have examined whether listed companies' investment has been affected by pension deficits using firm-level data from TPR for 2009 to 2014 matched to company accounts data.

(1) New staff increasingly join 'defined-contribution' pension schemes where the payouts depend on the income earned on investment and are not pre-determined.

(2) Data for around 3,400 listed and non-listed firms, which account for over 90% of aggregate private sector DB pension assets and liabilities.

### Chart B Large companies typically have smaller pension deficits as a share of their assets

Pension deficits by company size as a proportion of total deficit and compared to companies' total assets<sup>(a)</sup>



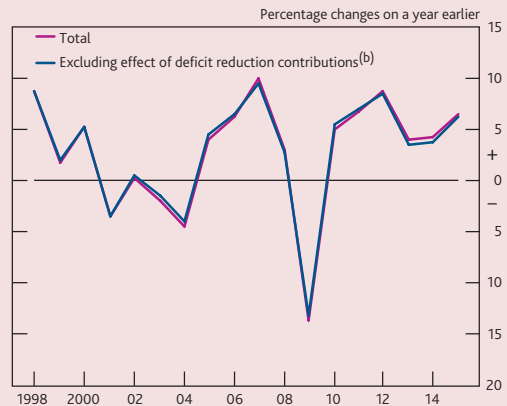
Sources: Bureau van Dijk, The Pensions Regulator (TPR), Thomson Reuters Datastream and Bank calculations.

- (a) Total UK pension deficit is measured on a 'technical provision' basis as estimated by TPR for March 2016. The value of companies' total assets is taken from their latest annual financial statements. Based on data for non-financial companies with DB pension schemes.  
 (b) Small and medium-sized enterprises; companies with turnover below £25 million.  
 (c) Companies with turnover between £25 million and £500 million.  
 (d) Companies with turnover above £500 million.

While investment is not found to be negatively associated with the size of a firm's pension deficit, it is found to be slightly lower among those firms with larger deficit reduction contributions. In aggregate though, this approach suggests that deficit reduction plans only had a very small effect on investment growth between 1996 and 2015. Bank staff estimate that annual investment growth was on average less

### Chart C Deficit reduction contributions are estimated to have reduced aggregate investment growth only very slightly

Business investment and the estimated effect of deficit reduction contributions<sup>(a)</sup>



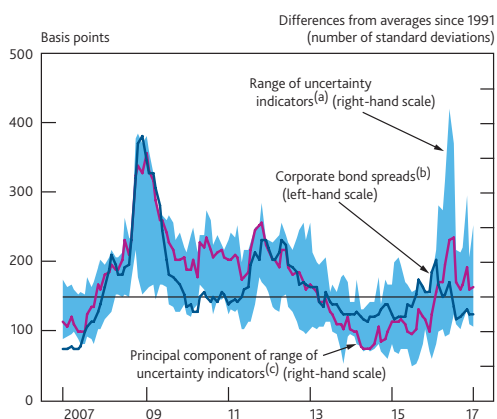
Sources: Bureau van Dijk, Pension Protection Fund, The Pensions Regulator, Thomson Reuters Datastream and Bank calculations.

- (a) Nominal business investment excluding the effect of the transfer of nuclear reactors from the public corporation sector to central government in 2005 Q2.  
 (b) Estimated based on listed companies' deficit reduction contributions for 2009 to 2014. Estimates of the impact were then applied to ONS data on employer special contributions, shown in Chart A.

than 0.1 percentage points lower over that period as a result of pension contributions (Chart C). The estimated impact of pension contributions on investment could reflect reduced cash flows available for investment or perhaps higher funding costs for companies with large deficits. However, this approach does not account for the fact that contributions are invested in financial assets, which may have lowered the cost of finance for other firms and therefore supported investment.

### Chart 2.10 The recent pickup in some measures of uncertainty was not accompanied by a sustained tightening in credit conditions

Range of uncertainty measures and corporate bond spreads



Sources: Bloomberg, Consensus Economics, Dow Jones Factiva, GfK (research on behalf of the European Commission), Thomson Reuters Datastream and Bank calculations.

- (a) A higher number indicates greater uncertainty. Range includes: the average standard deviation of monthly Consensus Economics forecasts for GDP growth in the current and next year ahead, seasonally adjusted by Bank staff; the number of media reports citing uncertainty in four national broadsheet newspapers; survey responses of households to questions relating to their personal financial situation and unemployment expectations; and the three-month implied volatilities for the FTSE 100 and sterling ERI — realised volatilities have been used prior to April 1992 and September 2001 respectively. Media and implied volatilities data for January are based on daily data up to 25 January. Household survey series based on data to December 2016.  
 (b) Sterling non-financial investment-grade corporate bond spreads as in Chart 1.12. End-month observation; series based on data up to 25 January.  
 (c) The first principal component extracted from the set of indicators listed in footnote (a).

In addition to the changes to tax and spending plans, the Government announced three new fiscal rules in the Autumn Statement: cyclically adjusted net borrowing to be less than 2% of GDP by 2020/21; public sector net debt to be falling as a share of GDP in 2020/21; and an increase in the cap on some welfare spending to £126 billion to apply in 2021/22. These rules replace the previous targets, which included having a balanced budget by 2019/20.

## 2.5 Net trade and the current account

Abstracting from erratic factors, Bank staff estimate that net trade subtracted around 0.3 percentage points from GDP growth in 2016 Q3. While headline trade dragged on growth more materially (Table 2.A), that reflected a large net import of non-monetary gold. This component of trade is erratic and only affects the composition of GDP growth — the counterpart to that drag on growth is a boost to private sector investment in valuables.

The fall in net trade, excluding erratic factors, in 2016 Q3 occurred despite the depreciation in sterling since November 2015. That depreciation will support net trade through two key channels — reducing domestic demand for imports and supporting UK exports. As explained in the box

## The Decision Maker Panel Survey

In August 2016, in response to the significant uncertainty around the impact of Brexit on companies' decision-making, the Bank launched a monthly survey of senior executives called the Decision Maker Panel (DMP) Survey.<sup>(1)</sup> The panel and questions have been designed in partnership with Professor Nicholas Bloom of Stanford University, Professor Paul Mizen of the University of Nottingham and colleagues from HM Treasury. This survey is based on a similar collaboration in the United States between Professor Bloom and the Atlanta Federal Reserve Bank. The data collected will facilitate research on the links between uncertainty and company behaviour.

The DMP Survey asks panel members about developments in, and the probabilities they ascribe to, a range of possible future outcomes for changes in three areas: investment and borrowing; employment and costs; and sales and prices. Panel members are sent a monthly survey focusing on one of these three topics on a rotating basis. The survey had 750 respondents in December and, while its full benefit will be realised over time as a time series of responses becomes available, it has already helped to inform the MPC's deliberations.<sup>(2)</sup>

As monitoring the impact of Brexit on firms is a key aim of the DMP Survey, in December respondents were asked how they expect their export revenues to be affected by Brexit. On average, exporting panel members reported that they expect only a small impact on export revenue, though they placed a

slightly greater weight on negative rather than positive impacts (Table 1). Among firms expecting a negative effect, some reported concern that their European customers are already in the process of shifting to non-UK suppliers based in the European Union. Among those expecting a positive effect, some reported that they expected the depreciation in sterling to support their exports.

**Table 1** DMP members, on average, expect Brexit to have a small impact on their export revenue, though there is uncertainty around that

Average of firms' probabilities for the effect of Brexit on export revenue in 2020<sup>(a)</sup>

Probability of outcome (per cent)	
Large positive effect	12
Moderate positive effect	15
No material effect	42
Moderate negative effect	19
Large negative effect	12

(a) A moderate effect was defined as less than 10% and a large effect as 10% or greater.

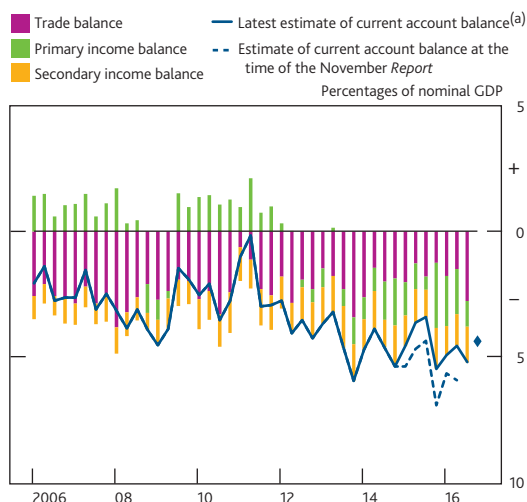
Despite pointing to a generally positive outlook for sales over the coming year, the survey suggests that companies are uncertain about future prospects. While some firms report that this uncertainty is weighing on their investment intentions, on average respondents placed a 70% weight on their investment spending rising over the coming year.

(1) For more information see [www.bankofengland.co.uk/research/Pages/onebank/decisionmakerpanel.aspx](http://www.bankofengland.co.uk/research/Pages/onebank/decisionmakerpanel.aspx).

(2) For example, see paragraph 15 of the November MPC Minutes; [www.bankofengland.co.uk/publications/minutes/Documents/mpc/pdf/2016/nov.pdf](http://www.bankofengland.co.uk/publications/minutes/Documents/mpc/pdf/2016/nov.pdf).

**Chart 2.11** The current account balance has been revised up materially

UK current account



(a) The diamond shows Bank staff's projection for the current account balance in 2016 Q4.

on pages 21–22 of the November *Report*, however, the timing and size of these effects is uncertain and will depend on how companies anticipate and respond to Brexit. Net trade is projected to support GDP growth in the coming quarters.

Nominal trade flows, together with other payments between the United Kingdom and the rest of the world, will be reflected in the current account. The current account deficit widened in Q3 (Chart 2.11). That reflected an increase in the nominal trade deficit, driven mainly by the significant net import of non-monetary gold. In contrast, the deficit on primary income — the net value of investment income received by UK residents — narrowed. As UK residents hold more foreign currency assets than they have foreign currency liabilities, the depreciation in sterling in Q3 will have supported investment income in that quarter.

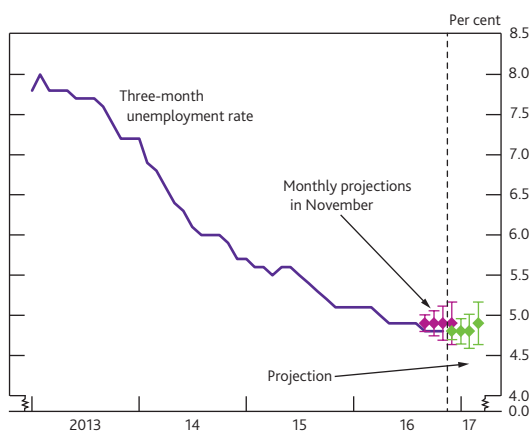
Despite the widening in the current account deficit in Q3, the deficit was smaller than anticipated in November as the data were revised materially in the latest release (Chart 2.11). Much of that reflected upward revisions to direct investment income and the nominal trade balance over the past. The current account is expected to have narrowed in Q4, reflecting both less negative trade and income balances.

# 3 Supply and the labour market

Employment growth has slowed although the unemployment rate has fallen a little further. Unemployment is projected to remain somewhat above its equilibrium rate, the estimate of which has been revised down since November as part of the MPC's regular assessment of aggregate supply-side conditions. Productivity growth is projected to be modest. Weak productivity and a degree of slack in the labour market are projected to continue to weigh on wage growth, as the drag from low inflation diminishes.

**Chart 3.1** The unemployment rate is projected to rise slightly

Unemployment rate and Bank staff's near-term projection<sup>(a)</sup>



(a) The magenta diamonds show Bank staff's central projections for the headline unemployment rate for the three months to September, October, November and December 2016, at the time of the *November Report*. The green diamonds show the current staff projections for the headline unemployment rate for the three months to December 2016, January, February and March 2017. The bands on either side of the diamonds show uncertainty around those projections based on one root mean squared error of past Bank staff forecasts for the three-month LFS unemployment rate.

**Table 3.A** Wage growth remains subdued

Annual wage growth

Per cent	Averages						
	2002–07	2010–12	2014	2015	2016 H1	2016 Q3	2016 Q4
(1) Total AWE <sup>(a)</sup>	4.2	2.0	1.3	2.5	2.3	2.4	2.8
(2) AWE regular pay <sup>(a)(b)</sup>	3.9	1.8	1.3	2.4	2.3	2.4	2.7
(1)–(2) Bonus contribution <sup>(a)(c)</sup>	0.3	0.2	0.0	0.1	0.0	0.0	0.1
Pay settlements <sup>(d)</sup>	3.2	1.7	2.0	2.2	2.7	2.8	2.7

Sources: Bank of England, Incomes Data Services, the Labour Research Department, ONS, XpertHR and Bank calculations.

(a) Figures for 2016 Q4 are data for the three months to November.

(b) Whole-economy total pay excluding bonuses and arrears of pay.

(c) Percentage points. The bonus contribution does not always equal the difference between total average weekly earnings (AWE) growth and AWE regular pay growth due to rounding.

(d) Average over the past twelve months, based on monthly data.

The outlook for GDP growth will be shaped by developments in demand (Section 2) but also by the supply capacity of the economy. That supply capacity depends on the amount of available labour and how productively it can be put to use. The MPC has reassessed its supply-side judgements in this *Report*. There remains, however, considerable uncertainty around the outlook for supply and the MPC will continue to reassess its judgements periodically.

The balance between demand and supply — that is, the degree of slack — is an important determinant of wage growth (see the box on pages 18–20) and broader inflationary pressures (Section 4). One clear symptom of slack following the financial crisis was an elevated unemployment rate (Chart 3.1). Although the unemployment rate has since fallen to below 5%, wage growth has remained subdued (Table 3.A). Given the persistence and extent of weak wage growth over the past couple of years, the MPC now judges that the unemployment rate can probably fall a little further before wage pressures build sufficiently to keep inflation at the 2% target over the medium term. There are risks in both directions to that central judgement and a range of views among MPC members. Wage growth is projected to pick up gradually as slack narrows and the drag from past low inflation diminishes. The outlook for wage growth will also depend on productivity growth, which is judged likely to continue to be weak.

The unemployment rate is projected to rise slightly in the near term (Chart 3.1) as labour demand softens. Flat employment in the three months to November (Section 3.1) could suggest that labour demand is already starting to weaken. But employment growth can be volatile, and the unemployment rate has fallen a little, while output growth has been firmer than expected.

The pace of output growth further ahead will in part depend on potential supply growth. Potential supply cannot be directly observed and the MPC therefore monitors a range of indicators to assess the current level of supply and its likely evolution (Section 3.2).

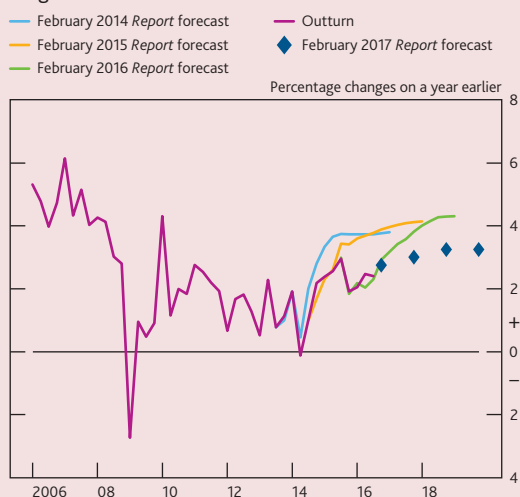
## Why has wage growth remained subdued?

Wages play a key role in households' and businesses' decision-making. As the primary source of income for most households, the current level of wages and their expected future growth will help shape households' spending decisions (Section 2). In aggregate, wages form the bulk of the domestic costs of UK-based firms, and so developments will influence both their spending and pricing decisions (Section 4).

Having averaged over 4% prior to the financial crisis, wage growth appears to have settled at around 2%–3% over the past two years. The MPC had expected falling unemployment and firmer productivity growth to lead to a pickup in wage growth (Chart A). The relatively stable growth in wages has therefore tended to be some way below past projections (Chart B).<sup>(1)</sup>

**Chart A Wage growth has failed to pick up in line with past projections**

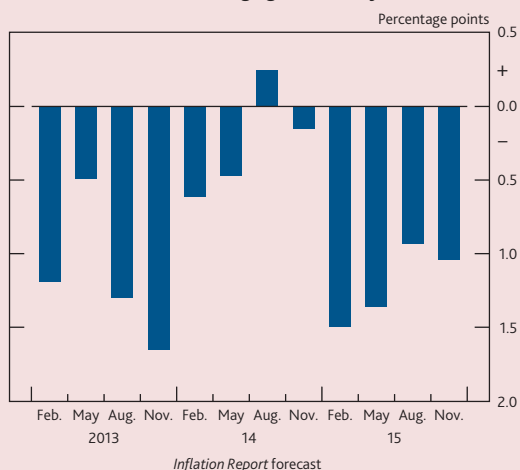
Wage outturns and MPC forecasts<sup>(a)</sup>



(a) Four-quarter whole-economy AWE growth.

**Chart B Wage forecast errors have tended to be on the downside, and by broadly similar amounts**

MPC forecast errors for wage growth one year ahead<sup>(a)</sup>



(a) Four-quarter whole-economy AWE growth.

This box considers wage growth in the context of its key underlying drivers, drawing on the broad range of analysis that was presented to the MPC as part of its regular assessment of aggregate supply-side conditions. Different explanations for weak wage growth have different implications for broader inflationary pressures. In aggregate, firms' ability to pay higher wages to their workers will depend on how productive the workforce is; if matched by higher productivity, higher wages might not affect the prices firms charge and hence inflation. In contrast, wage growth may depend on how firms and households expect other costs and prices to evolve; for example, if households expect prices to rise more quickly that could lead them to demand higher pay, which in turn could lead to higher inflation if companies raise prices to fund it. In addition, changes in slack — in particular changes in unemployment — will affect both wages and inflation.

## Productivity growth

One of the most important factors determining pay is productivity — the amount of output produced per worker — as this will determine, in large part, the amount of revenue companies in aggregate have to pay their employees. While wage and productivity growth can deviate in the short run, they have tended to move together over time. It is, therefore, perhaps not surprising that the recent weakness in wage growth has occurred alongside weak productivity growth (Section 3.2).

Wage growth relative to its pre-crisis rates has, however, been even weaker than productivity growth (Chart C). That suggests that other factors have also played a significant role in explaining low wage growth. And by lowering pay relative to productivity, those factors will have dampened growth in firms' costs and weighed on inflation (Section 4).

## Inflation and nominal wages

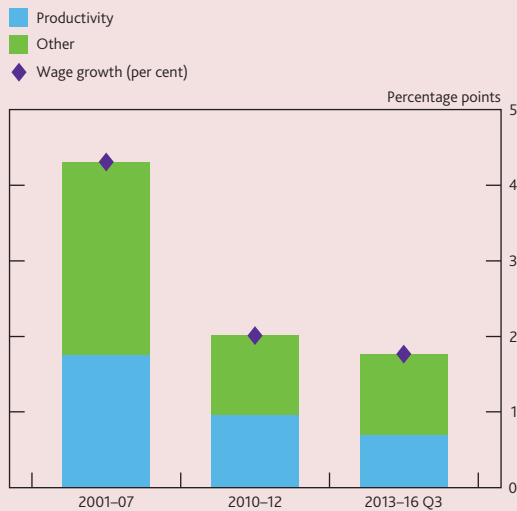
One factor that may have contributed to the weakness in wage growth over the past two years is the weakness in external cost pressures. Falls in global food and energy prices during 2014–15 boosted households' purchasing power (Section 2) and some contacts of the Bank's Agents reported that this reduced some of the pressure on companies to increase wages.

The recent rise in import costs for companies following the depreciation in sterling (Section 4) presents risks to the wage projection in both directions. Firms could seek to offset the reduction in their margins associated with those costs by attempting to push down other costs, including wages. Indeed, on balance, respondents to the Agents' annual pay survey reported that potential limits in their ability to pass on

<sup>(1)</sup> Other forecasters have also tended to overpredict wage growth. For further discussion see Saunders, M (2017), 'The labour market'; [www.bankofengland.co.uk/publications/Documents/speeches/2017/speech953.pdf](http://www.bankofengland.co.uk/publications/Documents/speeches/2017/speech953.pdf).

### Chart C Other factors, in addition to weak productivity, have weighed on wage growth in recent years

Stylised decomposition of four-quarter wage growth<sup>(a)</sup>



(a) Average whole-economy AWE growth. Productivity per worker is based on the backcast for the final estimate of GDP. The decomposition assumes a one-for-one relationship between productivity growth and wage growth over these periods.

cost increases to prices were expected to dampen growth in pay settlements over 2017.<sup>(1)</sup> In contrast, to the extent that companies pass higher import costs through to consumer prices, that could put upward pressure on wages in the near term if employees seek greater pay rises to reduce the hit to their purchasing power.

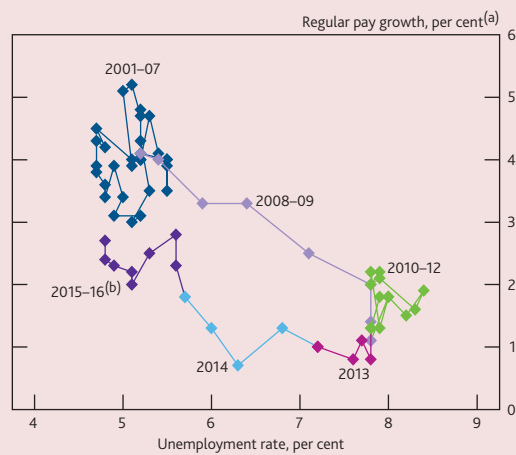
### Labour market slack

The persistent weakness in wage growth relative to productivity growth in recent years suggests that weak external cost pressures alone are unlikely to account for all of it. Slack in the labour market also tends to lead to weaker wage growth, since the easy availability of those looking for work can reduce the bargaining power of the remaining workforce. Indeed, wage growth was weak during 2010–13 as unemployment remained relatively high (Chart D). Falls in unemployment were then accompanied by a pickup in wage growth, and that continued into 2015. Subsequent falls in unemployment have not, however, been matched with rises in wage growth.

That could suggest that the unemployment rate may be able to fall further below pre-crisis rates before wage growth and labour cost pressures build sufficiently to keep inflation at the 2% target. Or equivalently, that the so-called 'equilibrium unemployment rate' is lower than prior to the crisis. Indeed, a range of models that control for other factors such as weak productivity growth and low inflation would suggest that the equilibrium unemployment rate would need to have fallen to somewhere between 4% and 4¾% to explain the MPC's forecast errors over 2013–16 (Chart B).

### Chart D Wage growth has been weak relative to the unemployment rate

Wage Phillips curve: wages and unemployment



(a) Whole-economy AWE total pay excluding bonuses and arrears of pay. Percentage change on a year earlier.  
(b) 2016 Q4 diamond shows data for the three months to November.

There are a number of factors that could have lowered the equilibrium unemployment rate over the past decade. The rising average age of the workforce and increased degree of educational attainment are characteristics that have tended to be associated with lower unemployment rates. In addition, tax and benefit reforms over many years may have lowered the equilibrium rate by increasing the incentive and ability to move from unemployment to employment.<sup>(2)</sup>

One indicator of how well suited the pool of unemployed is to the available jobs, and hence the equilibrium unemployment rate, is how long those people have been out of work for. The short-term unemployment rate has been below its pre-crisis average for some time (Chart 3.5), which may indicate that some of the newly unemployed have been able to move into work more quickly than in the past. The share of the workforce in long-term unemployment had been elevated in recent years. That may have suggested they were finding it harder to obtain work and hence placing less downward pressure on wages, consistent with a higher equilibrium unemployment rate. That long-term unemployment rate has, however, continued to drift down and is now close to its pre-crisis average. Such trends are perhaps consistent with survey measures of recruitment difficulties, which have remained close to or below their pre-crisis averages (Table 3.B), even as the unemployment rate has fallen.

In addition, the rate at which employees are moving from employment to unemployment, either due to redundancy or for other reasons, has been below past average levels in recent

(1) More detail on the survey can be found in the forthcoming *Agents' summary of business conditions* published on 8 February.

(2) For further discussion of these and other factors that may have affected the equilibrium unemployment rate, see Saunders, M (2017), 'The labour market'; [www.bankofengland.co.uk/publications/Documents/speeches/2017/speech953.pdf](http://www.bankofengland.co.uk/publications/Documents/speeches/2017/speech953.pdf).



years. To the extent that those relatively low job separation rates persist, that would also point to a lower equilibrium unemployment rate. One model estimated by Bank staff that takes into account both lower job separation rates and particular characteristics of the labour force — including education levels, demographics and how long people have been unemployed for — would suggest that the equilibrium unemployment rate could have fallen to 4¼%.

Previously the MPC's best collective judgement was that the equilibrium unemployment rate had remained close to its pre-crisis rate of around 5%. Given developments in wage growth, unemployment and recruitment difficulties over the past year, however, the MPC now judges that the equilibrium unemployment rate is more likely to be around 4½%. There are risks in both directions to that central judgement and a range of views among MPC members.

In addition to uncertainty around the degree of slack, there is also uncertainty around the relationship between slack and wage growth. It is possible that an increased ability to hire people from abroad over the past decade could have reduced the sensitivity of wage growth to domestic labour conditions over time. In contrast, past increases in slack may still be dampening wage growth at present. Following the financial crisis and a prolonged period of slack, employees may be reluctant to seek higher wages from their employers for fear of a lack of alternative jobs. It is difficult to judge how long any such scarring effects could persist.

### The near-term outlook for wage growth

Wage growth will also be affected by increases in the National Living Wage (NLW) and other costs related to employment. As discussed in previous *Reports*, Bank staff estimate that the introduction of the NLW is likely to add around 0.1 percentage points to average annual wage growth over the next few years. In contrast, higher non-wage costs associated with employment, such as pension contributions, could dampen wage growth if firms seek to limit the overall increase in their labour costs. While such costs have risen broadly in line with wages over the recent past (Section 4), the continued phasing in of automatic enrolment in workplace pension schemes may push costs up further, and the introduction of the apprenticeship levy may also lead to an increase in staff-related costs for some businesses.

Taken together, some degree of remaining slack in the economy and only modest productivity growth are projected to keep wage growth relatively subdued in the near term, as the drag from past low inflation wanes. It is also possible that higher bonus payments could raise aggregate wage growth temporarily following recent strength in profits, although this would have limited implications for companies' costs or inflation. The MPC will continue to monitor evidence on labour market slack and indicators of regular pay growth, which excludes bonuses, closely.

## 3.1 Labour demand

Having grown robustly in earlier quarters, employment was broadly flat in the three months to November (**Table 3.B**). Robust employment growth over 2012–15 helped to absorb much of the slack that had built during the financial crisis and growth was always likely to slow somewhat as that slack diminished. The recent stalling in employment growth has occurred alongside a reduction in the proportion of people participating in the labour market and the unemployment rate has continued to fall a little, against expectations in the November *Report* that it would be flat (**Chart 3.1**).

Employment growth has been lower than anticipated in November despite stronger-than-expected output growth (Section 2). While the weakness in employment growth could suggest that heightened uncertainty about the outlook has had a greater effect on hiring than expected, employment growth can be volatile. The number of vacancies — one key indicator of hiring — and the number of redundancies have not pointed to a slowing in employment growth (**Chart 3.2**). Employment growth is projected to return to positive but subdued rates in the near term. That is broadly consistent with survey indicators of employment intentions, which on

**Table 3.B Employment growth has slowed**

Employment growth and survey indicators of employment intentions and recruitment difficulties

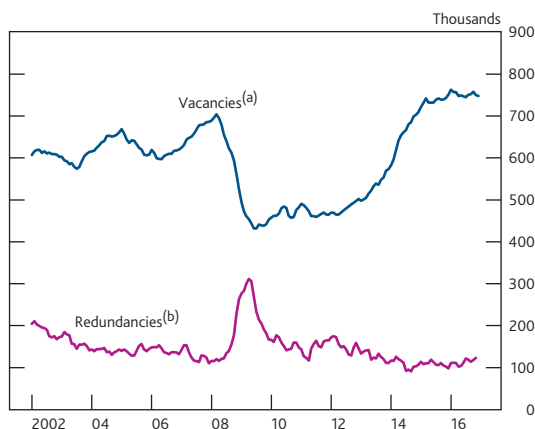
	Quarterly averages							
	2000–07	2008–09	2010–12	2013–14	2015	2016 H1	2016 Q3	2016 Q4
<b>Change in employment (thousands)<sup>(a)</sup></b>	70	-59	67	130	149	108	49	-9
of which, employees <sup>(a)</sup>	55	-67	32	106	112	50	63	-7
of which, self-employed and other <sup>(a)(b)</sup>	16	7	35	24	37	58	-14	-2
<b>Surveys of employment intentions<sup>(c)</sup></b>								
Agents <sup>(d)</sup>	0.8	-1.7	0.3	0.9	1.0	0.3	-0.1	-0.1
BCC <sup>(e)</sup>	19	-3	8	26	25	25	15	18
CBI <sup>(e)</sup>	4	-20	-3	17	19	20	8	17
<b>Surveys of recruitment difficulties<sup>(c)</sup></b>								
Agents <sup>(f)</sup>	1.5	-2.5	-1.1	0.4	2.0	1.4	1.3	1.1
BCC <sup>(g)</sup>	61	55	51	57	66	67	57	55
CBI, skilled <sup>(h)</sup>	27	15	16	23	34	34	28	32
CBI, other <sup>(h)</sup>	8	2	2	3	8	7	8	9

Sources: Bank of England, BCC, CBI, CBI/PwC, ONS and Bank calculations.

- (a) Changes relative to the previous quarter. Figures for 2016 Q4 are data for the three months to November.  
 (b) Other comprises unpaid family workers and those on government-supported training and employment programmes classified as being in employment.  
 (c) Measures for the Bank's Agents (manufacturing and services; employment intentions only), the BCC (non-services and services) and CBI (manufacturing, financial services and business/consumer/professional services; employment intentions also include distributive trades) are weighted together using employee shares from Workforce Jobs. The BCC data are non seasonally adjusted. Agents data are last available observation for each quarter.  
 (d) The scores refer to companies' employment intentions over the next six months on a scale of -5 to +5.  
 (e) Net percentage balance of companies expecting their workforce to increase over the next three months.  
 (f) The scores are on a scale of -5 to +5, with positive scores indicating greater recruitment difficulties in the most recent three months compared with the situation a year earlier.  
 (g) Percentage of respondents reporting recruitment difficulties over the past three months.  
 (h) Balances of respondents expecting skilled or other labour to limit output/business over the next three months (in the manufacturing sector) or over the next twelve months (in the financial services and business/consumer/professional services sectors).

**Chart 3.2 Both vacancies and redundancies have been flat in recent months**

Vacancies and redundancies



- (a) Excludes vacancies in agriculture, forestry and fishing. Data are up to December 2016.  
 (b) Data are up to November 2016.

average are around pre-crisis levels (Table 3.B). But there are large differences between those indicators and there continues to be uncertainty around the extent, timing and composition of further changes in employment.

In addition to changing the size of their workforce, firms can also adjust the hours that employees work, such as through the amount of overtime. Average hours fell in the three months to November. That could indicate a fall in labour demand but average hours will also be affected by changes in people's desired working patterns (Section 3.2).

### 3.2 Supply and slack

The amount of slack in the economy — the gap between demand and potential supply — is an important determinant of wage growth and broader inflationary pressure. The potential supply of goods and services cannot, however, be directly observed.

The MPC considers a range of indicators and approaches to estimate potential supply and the current degree of slack. One approach, taking a top-down perspective, is to use statistical techniques to estimate slack from past observations of GDP and taking into account other indicators such as inflation.<sup>(1)</sup> Given broadly stable output growth over 2016, this approach suggests that there is currently a small degree of spare capacity in the economy. The persistent weakness in wage growth, however, suggests that there is still likely to be some discernible slack in the labour market (see the box on pages 18–20). And bottom-up evidence of the components of supply — discussed further below — also suggest that some slack has persisted since the financial crisis, particularly within unemployment. The latest data continue to point to labour market participation being close to its equilibrium rate, although there is judged to be a little more slack in average hours worked. Offsetting that, there is judged to be less spare capacity within companies than assumed three months ago.

Taking all the evidence together, the MPC's best collective judgement is that there is at present a slightly greater degree of slack than was assumed in the November Report.

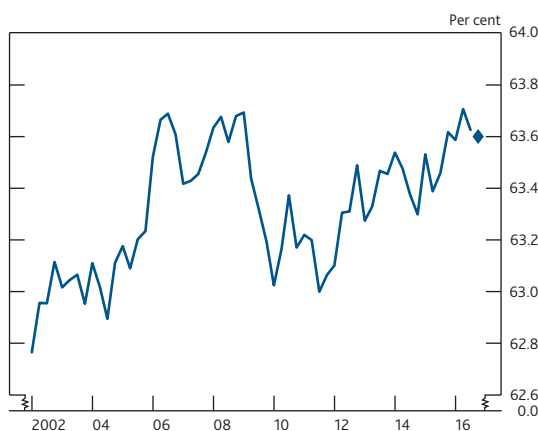
#### Population growth

Population growth is a key driver of increases in the potential size of the workforce. While population growth therefore leads to higher supply, it will also lead to increases in demand, and so is unlikely to have much of a direct impact on slack, wage growth or inflation. In the MPC's projections, population growth is assumed to evolve in line with the ONS's latest projection, made in October 2015.

(1) For further discussion see Berry, S, Corder, M, Duffy, C, Hackworth, C and Speigner, B (2015), 'Trends in UK labour supply', *Bank of England Quarterly Bulletin*, Vol. 55, No. 4, pages 344–56; [www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2015/q403.pdf](http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2015/q403.pdf).

**Chart 3.3** The participation rate has been fairly stable over 2016

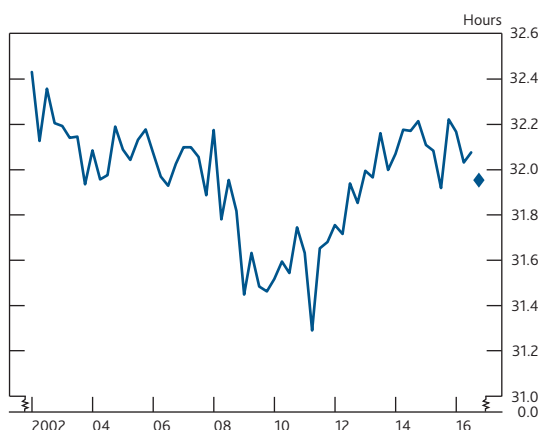
Labour force participation rate<sup>(a)</sup>



(a) Percentage of 16+ population. The diamond shows Bank staff's projection for 2016 Q4, based on data to November.

**Chart 3.4** Average hours worked are expected to have fallen in 2016 Q4

Average weekly hours worked<sup>(a)</sup>



(a) The diamond shows Bank staff's projection for 2016 Q4, based on data to November.

The main source of uncertainty around population growth over the next few years relates to the outlook for net migration. In the four quarters to 2016 Q2, ahead of the referendum, net inward migration was around 335,000, or 0.5% of the population. Under the ONS projections, net migration is assumed to fall over the next three years. The prospects for net migration at present are particularly uncertain, and will depend on a number of factors, including the United Kingdom's relative economic performance, the behaviour of the sterling exchange rate and government policy.

### Participation in the labour market

The supply of labour also depends on the share of the population that are in or looking for work. The participation rate fell in 2016 H2; but overall it has been fairly stable over the past year (**Chart 3.3**). Bank staff estimate that participation is currently close to its equilibrium rate.

The participation rate is projected to remain broadly flat over the forecast period, reflecting two offsetting factors. As older people typically have a lower participation rate, the rising average age of the population will tend to depress the aggregate participation rate. Offsetting that, however, the participation rate among older people has been increasing steadily and is expected to continue to rise.<sup>(1)</sup>

The projected slowing in income and demand growth (Section 2) may also affect participation rates over the near term. On the one hand, a slowing in real income growth as imported cost pressures pick up could support participation as households attempt to mitigate the impact on their incomes. On the other hand, in the face of low labour demand growth, some individuals could become temporarily discouraged from looking for work.

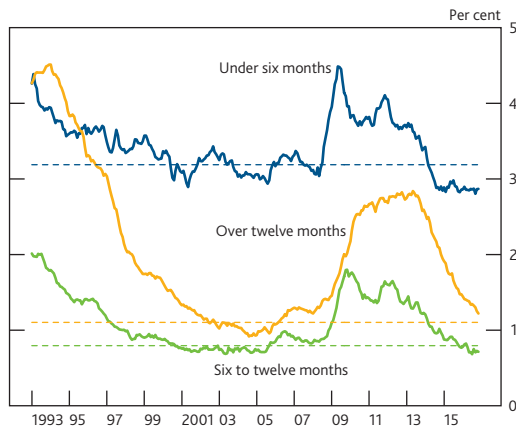
### Average hours

The outlook for potential supply will depend on how many hours households would like to work. Although average hours worked fell towards the end of 2016 (**Chart 3.4**), they have been higher over the past year than projected at the time of the MPC's previous assessment of aggregate supply-side conditions in February 2016. As a result, the equilibrium level of average hours is now judged to be somewhat higher such that there is currently a degree of slack in average hours. That equilibrium level is still projected to decline, although more gradually than previously projected. That decline largely reflects the fact that older workers generally prefer to work fewer hours and the average age of the workforce is rising. One upside risk to this may arise if households seek to supplement their hours and therefore pay in the face of a slowing in real income growth (Section 2) to support their income.

(1) For further discussion of longer-term trends in the participation rate see the box on pages 30–31 of the November 2014 Report; [www.bankofengland.co.uk/publications/Documents/inflationreport/2014/ir14nov.pdf](http://www.bankofengland.co.uk/publications/Documents/inflationreport/2014/ir14nov.pdf).

**Chart 3.5** The long-term unemployment rate has continued to fall

Unemployment rates by duration<sup>(a)</sup>

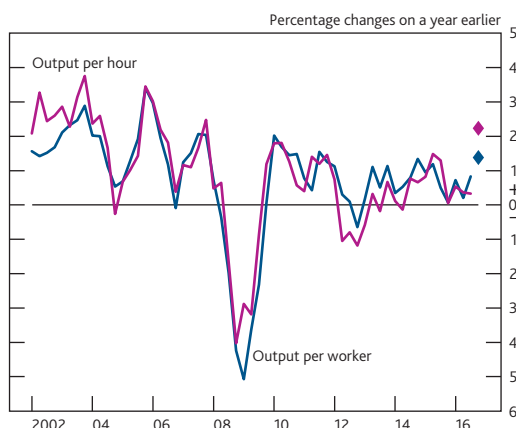


Sources: Labour Force Survey and Bank calculations.

(a) The number of people unemployed in each duration category, divided by the economically active population. Dashed lines are averages from 2002 to 2007.

**Chart 3.6** Hourly productivity is likely to have risen sharply, but the boost to growth is expected to be temporary

Measures of labour productivity<sup>(a)</sup>



(a) GDP is based on the backcast for the final estimate of GDP. The diamonds show Bank staff's projections for 2016 Q4, based on labour market data to November.

## Unemployment

The unemployment rate fell in the three months to November to 4.8%. Within that, the long-term unemployment rate has continued to fall, while shorter-term unemployment rates have been relatively flat over the past year (Chart 3.5). As discussed in the box on pages 18–20, the MPC judges that the equilibrium unemployment rate is likely to be lower than previously estimated, at 4½%.

Subdued labour demand is expected to lead to a slight rise in unemployment (Chart 3.1). There is significant uncertainty, however, around the near-term unemployment projection, relating both to the strength of labour demand and the equilibrium rate of unemployment. There are also risks in both directions to the MPC's central judgement on the current equilibrium unemployment rate and a range of views among MPC members.

In addition, the equilibrium rate may continue to change over time. Some of the factors that appear to have contributed to a fall over the recent past, such as increases in educational attainment and lower flows from employment to unemployment, may continue to bear down on the equilibrium rate. The rise in wage rates associated with the National Living Wage could, however, weigh on labour demand in some sectors and therefore lead to a small rise in the equilibrium unemployment rate.

## Productivity

As well as the total number of hours that can be worked, potential supply also depends on how productively those hours can be put to use. Four-quarter hourly productivity growth is expected to have picked up sharply to 2.2% in 2016 Q4 (Chart 3.6), much stronger than anticipated in November. In part, that reflected the fall in average hours worked (Chart 3.4). Consistent with a broadly stable path for average hours worked, hourly productivity growth is projected to fall back in coming quarters (Table 3.C). Growth in output per worker — which matters more for average wage growth — picked up by less, but is also projected to slow over the near term.

Productivity growth has tended to be well below expectations in recent years, contributing to a succession of errors in the MPC's forecasts for wage growth (see the box on pages 18–20). The persistent weakness in productivity growth is likely to reflect a range of factors. For instance, the stock of capital — equipment that can be put to use — has grown more gradually than labour supply over recent years. As additional capital tends to boost productivity, that will have weighed on growth.

More generally, productivity growth has been sluggish across a number of advanced economies. That may have reflected the effects of the financial crisis and there is evidence that the

**Table 3.C** Monitoring the MPC's key judgements

Developments anticipated in November during 2016 Q4–2017 Q2	Developments now anticipated during 2017 Q1–Q3
<b>Unemployment</b>	<b>Revised down slightly</b>
<ul style="list-style-type: none"> <li>Unemployment rate to rise to just over 5% by 2017 Q2.</li> </ul>	<ul style="list-style-type: none"> <li>Unemployment rate to rise to 5%.</li> </ul>
<b>Participation</b>	<b>Broadly unchanged</b>
<ul style="list-style-type: none"> <li>Participation rate to fall back slightly, and then remain just below 63¾%.</li> </ul>	<ul style="list-style-type: none"> <li>Participation rate to remain around its current level of just above 63½%.</li> </ul>
<b>Average hours</b>	<b>Revised up slightly</b>
<ul style="list-style-type: none"> <li>Average hours worked to fall by just under ½% in the year to 2017 Q2.</li> </ul>	<ul style="list-style-type: none"> <li>Average hours worked to be broadly flat.</li> </ul>
<b>Productivity</b>	<b>Broadly unchanged</b>
<ul style="list-style-type: none"> <li>Quarterly hourly labour productivity growth of between ¼% and ½%.</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly hourly labour productivity growth slowing to just above ¼%.</li> </ul>
<b>Earnings growth</b>	<b>Revised up slightly</b>
<ul style="list-style-type: none"> <li>Four-quarter AWE growth to remain between 2¼% and 2¾%.</li> </ul>	<ul style="list-style-type: none"> <li>Four-quarter growth in AWE regular pay to reach 3%.</li> </ul>

divergence between the most productive firms and the rest has increased globally.<sup>(1)</sup>

Future UK productivity growth will be sensitive to the post-Brexit trading arrangements between the United Kingdom and its economic partners. The box on page 29 of the *August Report* set out some of the long-term effects of openness to trade on productivity growth. It remains difficult to know the nature, scale and speed of companies' adjustment in anticipation of changes in future trading arrangements and given the uncertainty around those arrangements. Those uncertainties, as well as uncertainty over the outlook for domestic demand, are likely to lead to lower investment in capital equipment, research and skills than would otherwise be the case (Section 2) and so could weigh on productivity growth.

Overall, underlying potential productivity is projected to grow at a little over 1% a year, broadly in line with the November projection (Section 5). Productivity had been thought to be below its potential level in November, implying that actual productivity could grow a little more quickly for a period as companies worked off some slack. Following the reassessment of spare capacity across the economy in this *Report*, there is now judged to be greater slack within the labour market but less within companies. Reflecting that judgement, productivity is now expected to grow broadly in line with potential and therefore more slowly than in the November *Report*.

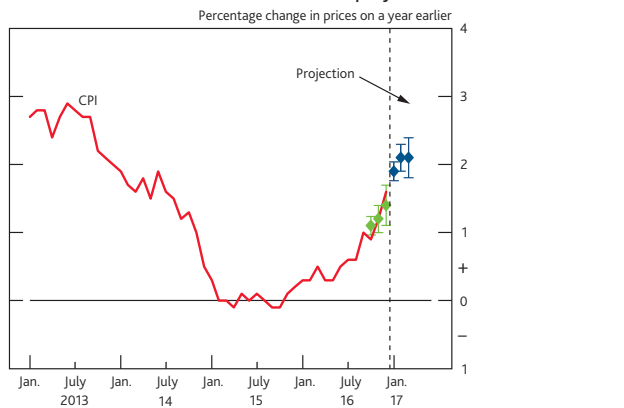
(1) For further discussion see Haldane, A (2016), 'One car, two car, red car, blue car'; [www.bankofengland.co.uk/publications/Documents/speeches/2016/speech945.pdf](http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech945.pdf).

# 4 Costs and prices

CPI inflation picked up to 1.6% in December. It is projected to rise above the 2% target for a time as the past fall in the sterling exchange rate passes through to consumer prices. The extent to which inflation rises above the target will be sensitive to any further movements in sterling, which has been volatile. It will also depend on domestic cost pressures. Slowing domestic demand growth is likely to weigh slightly on labour cost pressures and domestically generated inflation. Inflation expectations have risen but are judged to be broadly consistent with the MPC's 2% target.

**Chart 4.1** CPI inflation is projected to continue to rise

CPI inflation and Bank staff's near-term projection<sup>(a)</sup>

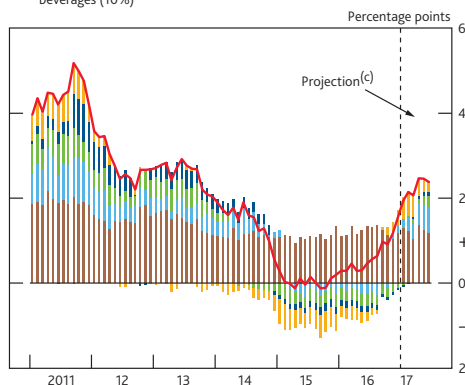


(a) The green diamonds show Bank staff's central projection for CPI inflation in October, November and December 2016 at the time of the November *Inflation Report*. The blue diamonds show the current staff projection for January, February and March 2017. The bands on each side of the green and blue diamonds show the root mean squared error of the projections for CPI inflation one, two and three months ahead made since 2004.

**Chart 4.2** Fuel has begun to push up inflation while the drag from food has faded

Contributions to CPI inflation<sup>(a)</sup>

Fuels and lubricants (3%)    Other goods<sup>(b)</sup> (35%)  
 Electricity and gas (4%)    Services (48%)  
 Food and non-alcoholic beverages (10%)    — CPI inflation (per cent)



Sources: Bloomberg, Department for Business, Energy and Industrial Strategy, ONS and Bank calculations.

(a) Contributions to annual CPI inflation. Figures in parentheses are 2016 CPI basket weights.  
 (b) Difference between CPI inflation and the other contributions identified in the chart.  
 (c) Bank staff projection. Electricity and gas prices projections assume that overall prices increase slightly in 2017 H1. Fuels and lubricants estimates use Department for Business, Energy and Industrial Strategy petrol price data for January 2017 and are then based on the February 2017 sterling oil futures curve shown in **Chart 4.4**.

## 4.1 Consumer price developments and the near-term outlook

CPI inflation increased to 1.6% in December, from 1% in September and above the projection of 1.4% at the time of the November *Report* (**Chart 4.1**).<sup>(1)</sup> The upside news partly reflected stronger-than-expected goods price inflation. A pickup in the contribution of airfares, a component of services prices, also pushed up inflation by more than anticipated, but this component tends to be volatile.

Inflation has picked up as the effects of the appreciation in sterling during 2013–15 have diminished, the effects of the more recent depreciation in sterling have started to emerge, and as oil prices have increased. That is apparent in a positive contribution from fuel prices (**Chart 4.2**). The drag from food prices has also lessened, albeit by a bit less than had been expected in November (see the box on page 26). And the drag on inflation from other imported goods and services prices has diminished.

CPI inflation is projected to continue to rise to around the 2% target in Q1 (**Chart 4.1**), and then above it further ahead, as the effects of the fall in sterling over 2016 on import prices continue to pass through to consumer prices (Section 4.2). The further rise in the US dollar price of oil since November will also increase the contribution of fuel prices to inflation. The evolution of these external cost pressures will be sensitive to further movements in sterling (Section 5), which has been volatile (Section 1).

The outlook for inflation will also depend on how domestic cost pressures develop and how companies adjust their margins (Section 4.3). Slowing domestic demand growth

(1) CPI inflation was 0.9% in October, more than 1 percentage point away from the MPC's 2% target. This triggered an open letter from the Governor to the Chancellor of the Exchequer, as required by the monetary policy remit. The letter is available on the Bank's website at [www.bankofengland.co.uk/monetarypolicy/Documents/pdf/cpiletter151216.pdf](http://www.bankofengland.co.uk/monetarypolicy/Documents/pdf/cpiletter151216.pdf).

## Developments in food price inflation

Food prices are sensitive to external developments and tend to respond quickly to changes in the exchange rate. They can be an important driver of wider inflation, directly accounting for 10% of the CPI basket. Moreover, the 2016 Q1 Bank/TNS household survey found that changes in the prices of food and drink were the most important influence on households' perceptions of overall inflation.

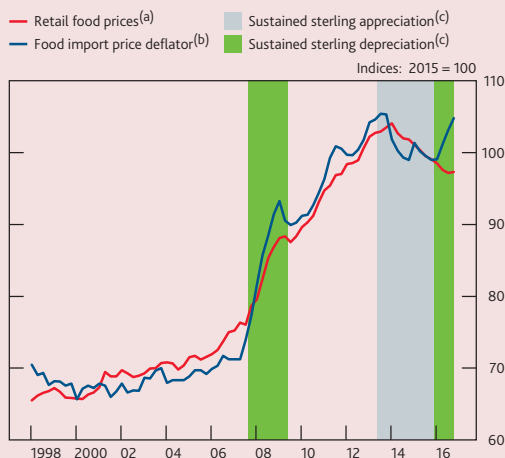
The high sensitivity of retail food prices to changes in imported food prices partly reflects the fact that around 50% of food and drink consumed in the United Kingdom is imported. In addition, food is highly tradable, particularly within the European Union. The pass-through of changes in sterling to food prices is often quicker than for other imported goods, with prices adjusting more frequently, particularly on more perishable items.

During 2016, retail food prices have not increased in line with the rise in sterling food import prices (Chart A). While that deviation could signal a lessening in the extent or speed at which changes in external cost pressures are feeding through to consumer prices, food prices will also be affected by domestic pressures.

One factor that could affect the pass-through of higher import prices is changes in the composition of food items, such as quality or size, although the ONS makes adjustments for this when constructing the CPI. A chocolate producer, for instance, may reduce the size of a chocolate bar in response to an increase in external costs, rather than increase its price. In this case, the ONS will adjust the observed price for any changes in weight. The ONS will also attempt to capture any material changes in quality, although more subtle shifts can be difficult to identify. Overall, non-price changes are unlikely to account for much of the recent deviation between retail and import prices.

**Chart A** Rising import prices have yet to be passed through to food prices

Food CPI and food import prices



Sources: ONS and Bank calculations.

- (a) Quarterly average level of food and non-alcoholic beverages component of the CPI.
- (b) Quarterly average level of food import price deflator. 2016 Q4 is the three-month average to November.
- (c) Shows periods of sustained sterling ERI appreciation and depreciation, including 2007 Q3 to 2009 Q1; 2013 Q2 to 2015 Q3; and 2015 Q4 to 2016 Q4.

The most likely reason for subdued food price inflation over the past year appears to be competition in the supermarket industry, as reported by contacts of the Bank's Agents. Customers have also reportedly become more price-sensitive in recent years, partly as a result of greater price transparency via the internet. In this environment, food retailers and producers may have absorbed the recent rises in external costs in their margins to a greater degree than normal to retain market share. Nonetheless, given the scale of the fall in sterling, it is unlikely that retailers and producers will be able to continue absorbing higher costs in their margins indefinitely. Already for some seasonal food items, where contracts with suppliers tend to be renewed more frequently, prices have begun to pick up. As such, it is likely that retail food prices more generally will start to respond to pressure from higher sterling import prices over 2017.

**Table 4.A** Monitoring the MPC's key judgements

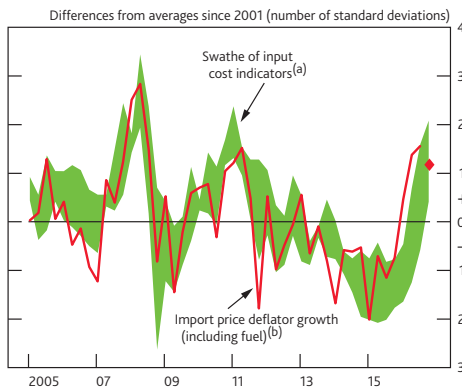
Developments anticipated in November during 2016 Q4–2017 Q2	Developments now anticipated during 2017 Q1–Q3
<b>Energy and import prices</b>	<b>Revised up slightly</b>
<ul style="list-style-type: none"> <li>• Domestic gas and electricity prices to be unchanged in 2017 H1.</li> <li>• Non-fuel import prices to rise by almost 9% in the year to 2017 Q2.</li> <li>• Commodity prices to evolve in line with the conditioning assumptions.</li> </ul>	<ul style="list-style-type: none"> <li>• Electricity price rises to take place in Q2 and a slight fall in gas prices in Q1.</li> <li>• Annual growth in non-fuel import prices of almost 5% in the year to Q3.</li> <li>• Commodity prices to evolve in line with the conditioning assumptions.</li> </ul>
<b>Unit labour costs</b>	<b>Revised down</b>
<ul style="list-style-type: none"> <li>• Four-quarter growth in whole-economy unit labour costs reaches just under 2%.</li> </ul>	<ul style="list-style-type: none"> <li>• Four-quarter growth in whole-economy unit labour costs slows temporarily to just under 1½%.</li> </ul>
<b>Inflation expectations</b>	<b>Unchanged</b>
<ul style="list-style-type: none"> <li>• Indicators of medium-term inflation expectations to continue to be broadly consistent with the 2% target.</li> </ul>	<ul style="list-style-type: none"> <li>• Indicators of medium-term inflation expectations to continue to be broadly consistent with the 2% target.</li> </ul>

(Section 2) is likely to weigh somewhat on labour cost growth and companies' margins. A period of above-target inflation could, however, present a risk to domestic cost pressures if it were to lead to markedly higher inflation expectations that, in turn, influence wage and price-setting decisions (see the box on pages 30–31).

## 4.2 Imported cost pressures

CPI inflation is affected by developments in external cost pressures, such as the cost of energy and imported goods and services. These in turn are sensitive to changes in the sterling exchange rate (Section 1). Following the fall in sterling over 2016, import prices have increased significantly, reflecting a rise in both energy and non-energy costs. Survey-based

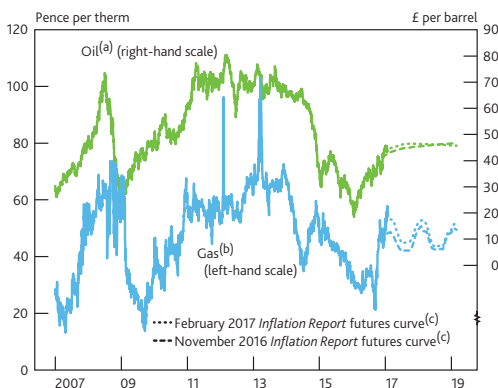
**Chart 4.3 External cost pressures have increased sharply**  
Quarterly growth in import prices including fuel and other measures of input cost pressures



Sources: Bank of England, BCC, CBI, IHS Markit, ONS and Bank calculations.

- (a) Includes producer price index manufacturing input prices; Markit/CIPS manufacturing input prices; BCC manufacturing raw materials prices; CBI manufacturing expected average costs; and Bank Agents' material costs scores.  
(b) Diamond shows Bank staff's projection for 2016 Q4.

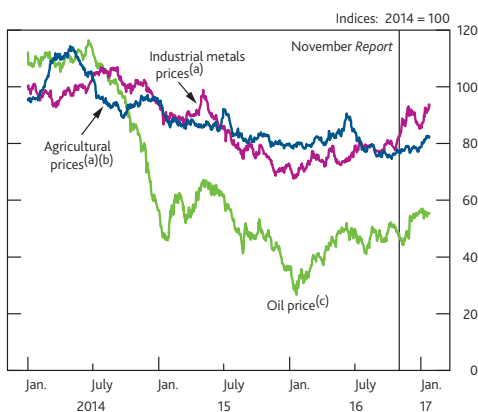
**Chart 4.4 Sterling wholesale energy prices have risen**  
Sterling oil and wholesale gas prices



Sources: Bank of England, Bloomberg, Thomson Reuters Datastream and Bank calculations.

- (a) US dollar Brent forward prices for delivery in 10–25 days' time converted into sterling.  
(b) One-day forward price of UK natural gas.  
(c) Fifteen working day average to 25 January 2017 and 26 October 2016 respectively.

**Chart 4.5 Commodity prices have increased since November**  
US dollar oil and commodity prices



Sources: Bloomberg, S&P indices, Thomson Reuters Datastream and Bank calculations.

- (a) Calculated using S&P GSCI US dollar commodity price indices.  
(b) Total agricultural and livestock S&P commodity index.  
(c) US dollar Brent forward prices for delivery in 10–25 days' time.

indicators have for some months suggested that rising import prices are pushing up companies' input prices (Chart 4.3).

### Energy prices

The sterling oil spot price has risen by 9% since the November Report (Chart 4.4). The futures curve, on which the MPC's forecasts are conditioned, remains broadly unchanged, however. According to market contacts, the rise in spot prices partly reflected the agreement in November between OPEC and some non-OPEC oil producers, committing to reduce production from the start of 2017 by around 2%. In addition, it is likely to reflect the stronger outlook for global demand growth (Section 1).

The rise in sterling oil prices since the start of 2016 has begun to push up inflation (Chart 4.2), with retail petrol prices in December around 10% higher than a year ago. The cost of oil currently makes up around a quarter of the cost of petrol and changes in oil prices tend to be passed through quickly. As such, the contribution of fuel prices to inflation is projected to increase slightly further, peaking in 2017 H1.

Changes in wholesale gas and electricity prices affect CPI inflation through households' and businesses' utility bills. Wholesale gas spot and futures prices have increased by 4% on average since November (Chart 4.4). One major supplier has announced a rise in domestic electricity prices from March, in addition to a smaller cut in domestic gas prices from January, while a number of other suppliers have committed to freezing their tariffs only until spring. Overall, retail energy bills are projected to increase in the first half of 2017, slightly earlier than anticipated in November.

### Non-energy import prices

Other commodity prices have increased since November alongside the pickup in energy prices (Chart 4.5). This, combined with the fall in sterling over the past year, is likely to feed through into higher non-energy UK import prices.

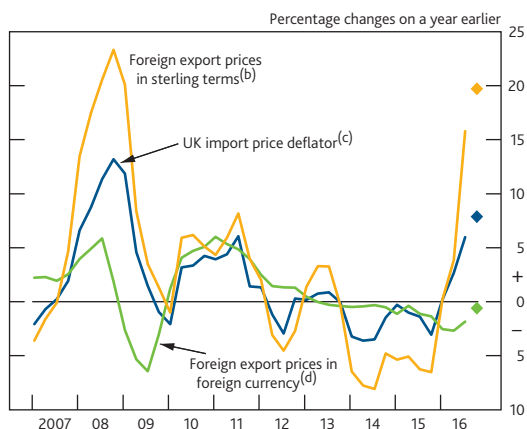
Non-energy foreign export prices, weighted according to countries' shares in UK imports, are expected to have fallen slightly in the four quarters to 2016 Q4 (Chart 4.6), though they are projected to rise over this year. The fall in sterling has, however, also already begun to put significant upward pressure on the cost of UK imports, which account for around 30% of the CPI basket. Four-quarter sterling non-energy import price inflation increased to 6% in 2016 Q3.

As discussed in previous Reports, Bank staff estimate that, on average, 60% of any change in sterling-denominated foreign export prices is passed through to UK import prices, with that pass-through mostly completed within a year. Based on this, the 18% fall in sterling from its November 2015 peak by itself would be consistent with an increase of around 10% in import prices once passed through completely. Consistent with that average pass-through over the past, import price inflation is expected to have risen further in 2016 Q4 (Chart 4.6).



### Chart 4.6 The fall in sterling has pushed up UK import price inflation

UK import and foreign export prices excluding fuel<sup>(a)</sup>



Sources: Bank of England, CEIC, Eurostat, ONS, Thomson Reuters Datastream and Bank calculations.

- (a) The diamonds show Bank staff's projections for 2016 Q4.  
 (b) Domestic currency non-oil export prices as defined in footnote (d), divided by the sterling effective exchange rate.  
 (c) UK goods and services import deflator excluding fuels and the impact of MTIC fraud.  
 (d) Domestic currency non-oil export prices of goods and services of 51 countries weighted according to their shares in UK imports. The sample excludes major oil exporters.

However, both the extent and pace of pass-through to import prices are uncertain and are likely to vary over time.

### Import price pass-through to consumer prices

The pass-through of changes in import prices to CPI inflation depends on a number of factors. These include the import content of consumption, the share of domestically produced goods that are substitutes for imports and how economic conditions affect businesses' pricing decisions. As discussed in previous *Reports*, Bank staff estimate that, on average over the past, changes in import prices have typically passed through to CPI in line with the import share. Pass-through is estimated to take place gradually, with annual inflation still being affected four years after the change in sterling.

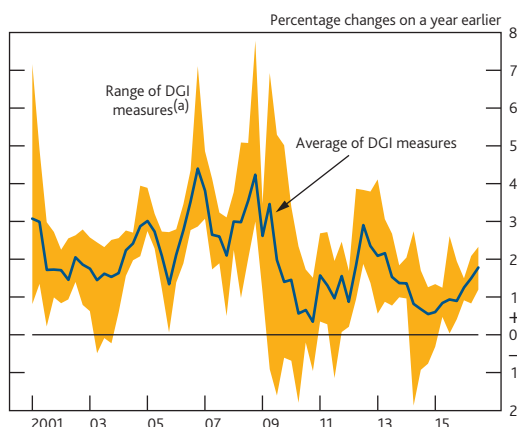
How much and how quickly businesses pass through changes in import prices associated with a change in sterling, and whether the prices of other goods and services adjust, is uncertain and will vary over time. It is still too early for changes in import prices over the second half of 2016 to be materially affecting most consumer prices. Some components respond more rapidly to changes in imported costs, however, and may provide some signal on the pace of pass-through. As noted above, petrol prices have already responded to changes in sterling oil prices.

Another component of CPI where the increase in import prices might be expected to be already visible at this stage is food. As explained in the box on page 26, changes in import prices typically pass through to the cost of food relatively quickly. Retail food prices have begun to pick up, having fallen for much of the past two years, but annual growth in December remained negative. Contacts of the Bank's Agents have suggested that competitive pressures specific to the food retail sector may be holding down food price inflation.

As discussed in the November *Report*, the MPC judges that the speed of pass-through from import prices to consumer prices of the depreciation in sterling since its peak in November 2015 is likely to be faster than average (Section 5). This reflects evidence that suggests that large moves in the exchange rate,<sup>(1)</sup> or moves in exchange rates that stem from supply developments,<sup>(2)</sup> tend to be associated with faster pass-through to consumer prices. These conditions remain relevant. Sterling is 18% below its November 2015 peak and appears to have been sensitive to changing views on the likely nature of UK trading arrangements following Brexit (Section 1). The MPC will continue to monitor closely how pass-through is evolving.

### Chart 4.7 Measures of DGI have risen but remain below past averages

Measures of domestically generated inflation (DGI)



- (a) Includes: whole-economy labour costs divided by GDP, based on the backcast of the final estimate of GDP; private sector AWE total pay divided by private sector productivity, based on the backcast of the final estimate of GDP; the GDP deflator; the GVA deflator excluding government; and the services producer prices index.

(1) See, for example, Bonadio, B, Fischer, A and Saure, P (2016), 'The speed of the exchange rate pass-through', Swiss National Bank, which discusses the speed of pass-through following the appreciation of the Swiss franc in 2015.

(2) See, for example, Forbes, K, Hjortsoe, I and Nenova, T (2015), 'The shocks matter: improving our estimates of exchange rate pass-through', *External MPC Unit Discussion Paper No. 43*; [www.bankofengland.co.uk/monetarypolicy/Documents/externalmpc/extmpcpaper0043.pdf](http://www.bankofengland.co.uk/monetarypolicy/Documents/externalmpc/extmpcpaper0043.pdf).

### 4.3 Domestic cost pressures

In addition to imported cost pressures, changes in domestic costs are a key driver of CPI inflation and will determine where inflation settles once changes in imported costs have passed through. The path for inflation, however, will also depend on the extent to which companies adjust their margins in response to developments in those costs. There are a number of indicators of the rate at which domestic costs and profit margins are changing, known as domestically generated inflation (DGI). Overall, these indicators have increased in 2016 Q3, but are still below past average rates (Chart 4.7).

One important measure of DGI is growth in labour costs, which form the largest part of the domestic cost of producing output. As explained in the box on pages 18–19, subdued growth in unit labour costs — the average labour cost of producing a unit of output — in recent years has largely reflected the weakness in wage growth (Chart 4.8). Four-quarter whole-economy unit labour cost growth has however picked up in recent quarters and, at 2.3% in Q3, was only a little below pre-crisis averages. That recent pickup mainly reflects a rise in non-wage labour costs, which include National Insurance and pensions contributions.

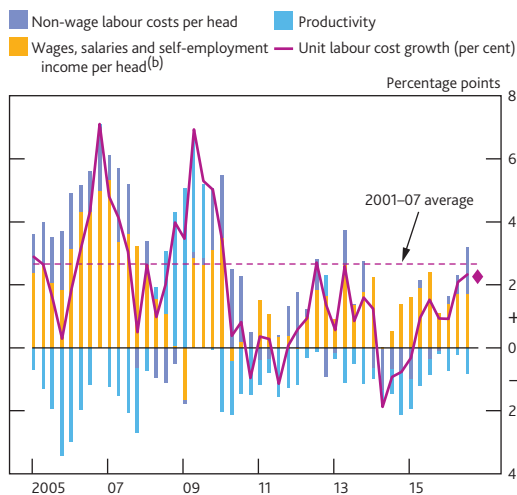
Unit labour cost growth is projected to fall back a little during 2017. Growth in both wages and productivity per worker are expected to increase slightly over coming quarters (Section 3), while the contribution from non-wage costs, which tend to be volatile, is expected to decline. The continued phasing in of automatic enrolment in workplace pensions schemes is likely to push up non-wage labour costs over 2017, but overall those costs are projected to be broadly unchanged. Consistent with this, respondents to the Agents' pay survey in January reported on balance that changes to employers' pension contributions were only expected to be a minor factor in pushing up labour costs over the next twelve months.

Developments in companies' margins will determine the extent to which these changes in domestic costs, alongside changes in external costs, affect consumer prices. Margins on consumer goods and services were estimated to be squeezed during the financial crisis, but recovered during 2014 and 2015 (Chart 4.9). In recent quarters, however, margins appear to have narrowed, and are currently perhaps slightly below past averages. This is consistent with the limited change in consumer prices so far, as import costs have risen.

Firms are likely to seek to rebuild their margins over time by raising prices. As explained in Section 4.2, the nature of the fall in sterling is likely to mean they do so somewhat more quickly than on average over the past. The outlook for inflation may also be affected by changes in inflation expectations, insofar as they influence wage and price-setting behaviour (see the box on pages 30–31).

**Chart 4.8 Unit labour cost growth has increased in recent quarters**

Decomposition of four-quarter whole-economy unit labour cost growth<sup>(a)</sup>

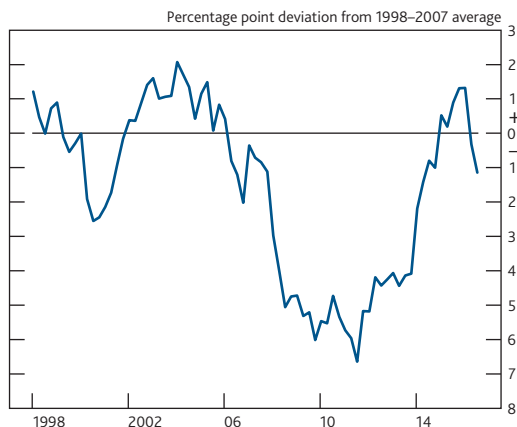


Sources: ONS and Bank calculations.

- (a) Whole-economy labour costs divided by GDP, based on the backcast of the final estimate of GDP. The diamond shows Bank staff's projection for 2016 Q4.  
 (b) Self-employment income is calculated from mixed income, assuming that the share of employment income in that is the same as the share of employee compensation in nominal GDP less mixed income.

**Chart 4.9 Companies' margins narrowed during 2016**

Estimated margins on consumer goods and services<sup>(a)</sup>



Sources: ONS and Bank calculations.

- (a) Calculated as differences in the ratio of the CPI, seasonally adjusted by Bank staff, and estimated costs of production and distribution for consumer goods and services. Costs consist of imports, energy, taxes and labour, weighted to reflect their intensity in CPI. The underlying weights attached to each cost component are based on the *United Kingdom Input-Output Analytical Tables 2010*, adjusted to reflect the composition of CPI. Where applicable, the weights capture each factor's contribution to all stages of the domestic production process.

## Monitoring inflation expectations

The MPC projects that inflation will rise sharply above the 2% target, and only fall back gradually, as higher import prices pass through (Section 5). As noted in the Monetary Policy Summary, however, there are limits to the extent to which the MPC is willing to tolerate above-target inflation. Those limits depend in part on the evolution of inflation expectations. Material shifts in people's beliefs in the MPC's willingness and ability to return inflation to target, were they to feed through into prices and wages, could increase the risk that inflation remains more persistently above the target.

This box sets out the range of indicators the MPC monitors to judge whether inflation expectations remain consistent with inflation returning to the 2% target.

Overall, the MPC judges that indicators of medium-term inflation expectations continue to be broadly consistent with the 2% target and remain well anchored. The levels of medium to long-term measures of inflation expectations have picked up, but are broadly around past averages (Table 1). While longer-term expectations appear to have become more sensitive to changes in shorter-term expectations, that sensitivity may well return to normal as inflation rises. There is also little evidence that financial markets' and professional forecasters' uncertainty about inflation in the medium term has risen recently. The MPC will continue to monitor measures of expectations closely as inflation rises further.

### Levels of inflation expectations

Overall, indicators of inflation expectations increased over the second half of 2016, and are around their levels in 2006–07, when inflation had been close to the 2% target for some time (Chart A).<sup>(1)</sup> Judging whether inflation expectations are consistent with the MPC's target depends in part on the horizon under consideration.

Indicators of short-term inflation expectations tend to respond to changes in actual inflation and the near-term outlook.<sup>(2)</sup> Consistent with this, survey measures of short-term household and corporate inflation expectations, and measures of short-term expectations derived from financial markets, fell somewhat below series lows during the recent period of low CPI inflation (Table 1).<sup>(3)</sup> More recently, these measures have risen as CPI inflation and the MPC's own projections have picked up.

Indicators of longer-term inflation expectations are potentially more informative when judging whether expectations are consistent with inflation at target in the medium term. Survey measures of long-term household expectations fell below past averages when inflation was low, but by much less than

**Table 1** Indicators of inflation expectations<sup>(a)</sup>

Per cent	2000 (or start of series) to 2007 averages <sup>(b)</sup>	Averages since 2008	2014	2015	2016				2017	
					Q1	Q2	Q3	Q4		Q1 <sup>(c)</sup>
<b>One year ahead inflation expectations</b>										
<b>Households<sup>(d)</sup></b>										
Bank/GfK/TNS <sup>(e)</sup>	2.4	3.0	2.7	2.0	1.8	2.0	2.2	2.8	n.a.	
Barclays Basix <sup>(f)</sup>	2.8	2.8	2.3	1.5	n.a.	1.7	1.7	2.2	n.a.	
YouGov/Citigroup (Nov. 2005)	2.5	2.4	2.0	1.3	1.4	1.5	1.8	2.4	2.6	
<b>Companies (2008 Q2)<sup>(g)</sup></b>										
Financial markets (Oct. 2004) <sup>(h)</sup>	2.6	2.7	2.8	2.5	2.4	2.6	2.9	3.4	3.6	
<b>Two to three year ahead expectations</b>										
<b>Households<sup>(d)</sup></b>										
Bank/GfK/TNS (2009 Q1) <sup>(e)</sup>	n.a.	2.7	2.7	2.3	2.1	2.2	2.2	2.5	n.a.	
Barclays Basix <sup>(f)</sup>	3.2	3.1	2.6	1.9	n.a.	2.2	2.0	2.7	n.a.	
<b>Professional forecasters (2006 Q2)<sup>(i)</sup></b>										
Financial markets (Oct. 2004) <sup>(i)</sup>	2.8	3.0	3.1	3.0	2.8	2.9	3.0	3.5	3.5	
<b>Five to ten year ahead expectations</b>										
<b>Households<sup>(d)</sup></b>										
Bank/GfK/TNS (2009 Q1) <sup>(e)</sup>	n.a.	3.2	3.1	2.8	2.9	3.4	3.0	3.1	n.a.	
Barclays Basix (2008 Q3) <sup>(f)</sup>	n.a.	3.7	3.6	3.1	n.a.	3.6	3.0	3.7	n.a.	
YouGov/Citigroup (Nov. 2005)	3.5	3.2	2.9	2.7	2.8	2.7	2.5	2.8	3.0	
Financial markets (Oct. 2004) <sup>(k)</sup>	3.0	3.4	3.4	3.3	3.2	3.1	3.1	3.5	3.6	
Memo: CPI inflation	1.6	2.4	1.5	0.0	0.4	0.4	0.7	1.2	n.a.	

Sources: Bank of England, Barclays Capital, Bloomberg, CBI (all rights reserved), Citigroup, GfK, ONS, TNS, YouGov and Bank calculations.

- (a) Data are non seasonally adjusted.  
 (b) Dates in parentheses indicate start date of the data series.  
 (c) Financial markets data are averages from 3 January to 25 January 2017. YouGov/Citigroup data are for January.  
 (d) The household surveys ask about expected changes in prices but do not reference a specific price index, and the measures are based on the median estimated price change.  
 (e) In 2016 Q1, the survey provider changed from GfK to TNS.  
 (f) No data available for 2016 Q1.  
 (g) CBI data for the manufacturing, business/consumer services and distribution sectors, weighted together using nominal shares in value added. Companies are asked about the expected percentage price change over the coming twelve months in the markets in which they compete.  
 (h) Instantaneous RPI inflation one year ahead implied from swaps.  
 (i) Bank's survey of external forecasters, inflation rate three years ahead.  
 (j) Instantaneous RPI inflation three years ahead implied from swaps.  
 (k) Five-year, five-year forward RPI inflation implied from swaps.

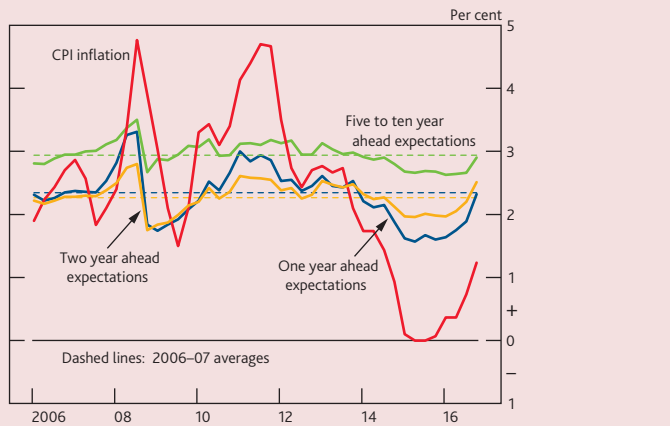
short-term measures (Table 1). These have drifted slightly higher over 2016 to around past averages.

Having fallen earlier in the year, indicators of longer-term inflation expectations derived from financial market prices for inflation compensation rose ahead of the November *Report* to around past averages. Since then, they have been broadly stable, in contrast to rises in equivalent measures for the United States and euro area (Chart 1.7). Market-specific factors in the United Kingdom can sometimes make

- (1) The level of inflation expectations is assessed against series averages, as measures of long-term inflation expectations do not directly reference CPI inflation. For more information, see Domit, S, Jackson, C and Roberts-Sklar, M (2015), 'Do inflation expectations currently pose a risk to inflation?', *Bank of England Quarterly Bulletin*, Vol. 55, No. 2, pages 165–80; [www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2015/q205.pdf](http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2015/q205.pdf).  
 (2) For more information, see Rowe, J (2016), 'How are households' inflation expectations formed?', *Bank of England Quarterly Bulletin*, Vol. 56, No. 2, pages 82–86; [www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2016/q2/a3.pdf](http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2016/q2/a3.pdf).  
 (3) Household measures exclude the GfK/EC balance of expected price trends (as in Chart 2.5). That survey asks whether inflation is expected to rise or fall over the next twelve months, by comparison with the past twelve months. As such, results cannot readily be interpreted as consistent with a particular level of expected inflation.

### Chart A Measures of inflation expectations have picked up to around past averages

CPI inflation and summary measures of the levels of inflation expectations<sup>(a)</sup>



Sources: Bank of England, Barclays Capital, Bloomberg, CBI (all rights reserved), Citigroup, GfK, HM Treasury, ONS, TNS, YouGov and Bank calculations.

(a) Data are quarterly and non seasonally adjusted. Data for CPI inflation are quarterly averages of monthly data. The summary measures are estimated with a statistical term structure model, using information from surveys of households, firms and professional forecasters, as well as financial market inflation swaps. For more detail see Anderson, G and Maule, B (2014), 'Assessing the risk to inflation from inflation expectations', *Bank of England Quarterly Bulletin*, Vol. 54, No. 2, pages 148–62; [www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q204.pdf](http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q204.pdf).

developments in these measures difficult to interpret. For example, market contacts have suggested that some of the fall and then rise during 2016 has, in part, reflected changes in demand for inflation protection from pension funds.

### Sensitivity of inflation expectations

If longer-term measures move with news about the near-term outlook, this could suggest that expectations are not well anchored. Financial market measures do appear to have become more sensitive to short-term inflation news over the past two years. During 2004–07, and in the period of high inflation during 2010–11, there was little correlation between inflation expectations beyond two years ahead with those one year ahead (Chart B). Since 2015, however, longer-term inflation expectations have, on average, tended to move by around 0.3 percentage points in response to a 1 percentage point change in one year ahead expectations.

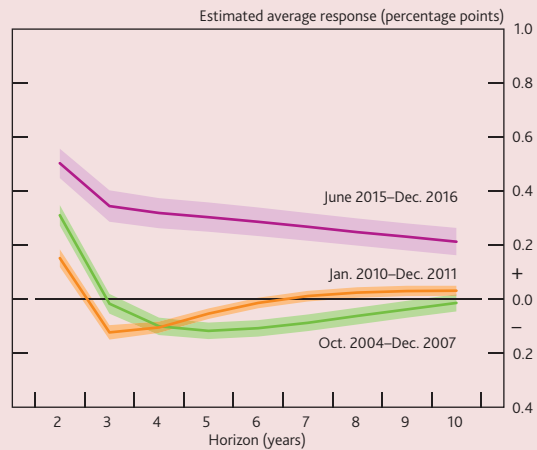
While that increased sensitivity could suggest a risk that inflation expectations are less well anchored than in the past, it is also possible that the pickup in sensitivity reflected specific concerns that the period of low inflation during 2015–16 could have become more entrenched. As such, this sensitivity may return to more normal levels as inflation continues to rise and those concerns recede.

### Uncertainty around future inflation

Indicators of uncertainty about future inflation may contain information about people's degree of confidence in the MPC achieving the inflation target. Uncertainty about future inflation among professional forecasters — calculated as the

### Chart B The sensitivity of financial market indicators of inflation expectations increased during the period of low inflation

Changes in instantaneous forward implied inflation rates in response to a 1 percentage point increase in one year ahead implied inflation<sup>(a)</sup>



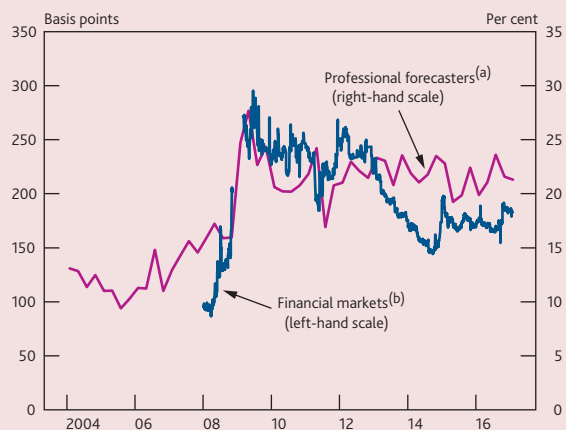
Sources: Bloomberg and Bank calculations.

(a) The average changes are estimated using the slope coefficients from regressions of daily changes in instantaneous RPI inflation forward rates at each horizon on the daily change in the one year ahead instantaneous RPI inflation forward rate and a constant. The instantaneous forward rates are derived from inflation swaps. The swathes cover two standard errors either side of the estimated slope coefficients.

average probability attached to CPI inflation being greater than 1 percentage point above or below the target in the medium term — has been broadly stable in recent years, albeit higher than prior to the crisis (Chart C). Market-based indicators of uncertainty about future inflation, implied by options prices, have also been relatively stable and lower than during the crisis.

### Chart C Uncertainty around future inflation has been stable recently

Uncertainty around three year ahead inflation for professional forecasters and implied by financial market prices



Sources: Bank of England, Bloomberg and Bank calculations.

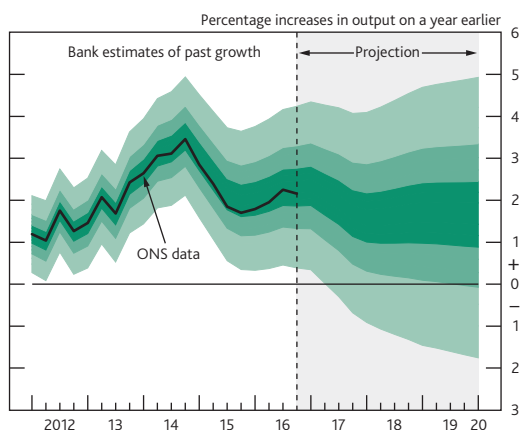
(a) Average probability that inflation will be more than 1 percentage point away from the target, calculated from the probability distributions for inflation reported by forecasters responding to the Bank's survey. Forecasters' reported probability distributions for CPI inflation two years ahead between February 2004 and February 2006; and for CPI inflation three years ahead from May 2006 onwards.

(b) Standard deviation of the probability distribution of annual RPI inflation outturns three years ahead implied by options. Data are from 2 January 2008 to 25 January 2017. It is not possible to construct this measure for some days due to a lack of available option price quotes.

# 5 Prospects for inflation

UK economic activity remained resilient in the second half of 2016. Growth is likely to slow over 2017 as households adjust their spending to lower real income growth resulting in large part from the 18% fall in sterling since late 2015. That fall in sterling will raise CPI inflation, which is likely to return to around the 2% target by February and then rise above it over the following months. Conditioned on a market path for Bank Rate that rises to just under 0.75% by early 2020, the MPC projects CPI inflation to fall back gradually from the middle of 2018. Continued pass-through of higher import prices means, however, that inflation is projected to remain somewhat above the 2% target at the end of the Committee's three-year forecast period.

**Chart 5.1** GDP projection based on market interest rate expectations, other policy measures as announced



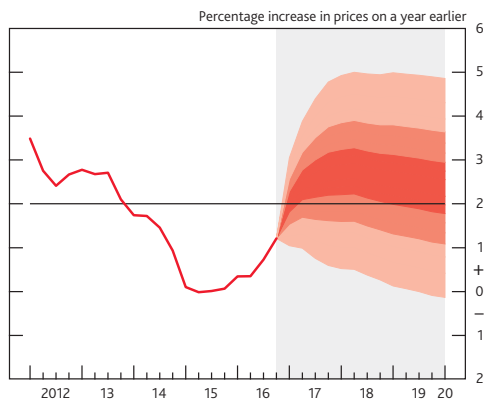
The fan chart depicts the probability of various outcomes for GDP growth. It has been conditioned on the assumptions in Table 5.A footnote (b). To the left of the vertical dashed line, the distribution reflects the likelihood of revisions to the data over the past; to the right, it reflects uncertainty over the evolution of GDP growth in the future. If economic circumstances identical to today's were to prevail on 100 occasions, the MPC's best collective judgement is that the mature estimate of GDP growth would lie within the darkest central band on only 30 of those occasions. The fan chart is constructed so that outcomes are also expected to lie within each pair of the lighter green areas on 30 occasions. In any particular quarter of the forecast period, GDP growth is therefore expected to lie somewhere within the fan on 90 out of 100 occasions. And on the remaining 10 out of 100 occasions GDP growth can fall anywhere outside the green area of the fan chart. Over the forecast period, this has been depicted by the light grey background. See the box on page 39 of the November 2007 *Inflation Report* for a fuller description of the fan chart and what it represents.

The UK economy has remained resilient, with activity growing at close to its past average rate in 2016. Growth has been stronger than envisaged in the immediate aftermath of the vote to leave the European Union when survey evidence pointed to a sharp slowdown in activity. That partly reflects robust growth in consumer spending, with few signs that households are cutting back expenditure ahead of a squeeze in their real incomes. Official data for investment have been considerably weaker, although above recent expectations. Reinforcing the domestic news, there are signs of increasing momentum in the global economy with a stronger medium-term outlook in several economies, supported by fiscal policy (Key Judgement 1). That has been reflected in global asset prices, with longer-term interest rates and equity prices rising.

Domestic demand growth is still expected to slow over the course of this year as higher prices for imported goods and services begin to weigh on households' spending power (Key Judgement 2). That pulls down four-quarter GDP growth, which settles at around 1¾% from the end of 2017 (Chart 5.1). That slowdown comes a little later than previously assumed. Moreover, the Government's Autumn Statement represented a fiscal stimulus, relative to previously announced plans, the outlook for global growth is stronger, and credit conditions and equity prices are more supportive. Taking all the news together, the MPC now judges that the growth outlook is stronger than thought in November (Table 5.A). Overall, in the central projection that leaves the level of GDP around 1% higher in three years' time than projected in November. Relative to expectations in the May 2016 *Report*, just before the EU referendum, however, the level of GDP is still around 1½% lower in the medium term despite the significant monetary, macroprudential and fiscal support since then.

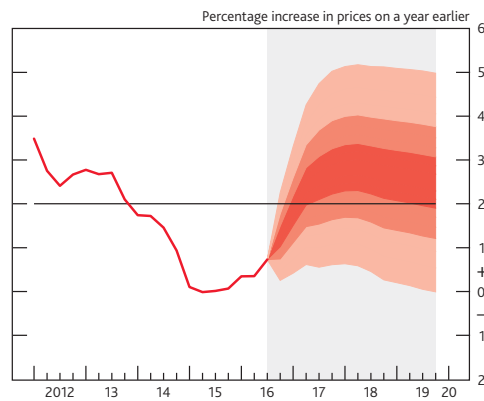
The stronger demand profile is in large part matched by a higher level of supply. That reflects a judgement as part of the MPC's

**Chart 5.2** CPI inflation projection based on market interest rate expectations, other policy measures as announced



Charts 5.2 and 5.3 depict the probability of various outcomes for CPI inflation in the future. They have been conditioned on the assumptions in Table 5.A footnote (b). If economic circumstances identical to today's were to prevail on 100 occasions, the MPC's best collective judgement is that inflation in any particular quarter would lie within the darkest central band on only 30 of those occasions. The fan charts are constructed so that outcomes of inflation are also expected to lie within each pair of the lighter red areas on 30 occasions. In any particular quarter of the forecast period, inflation is therefore expected to lie somewhere within the fans on 90 out of 100 occasions. And on the remaining 10 out of 100 occasions inflation can fall anywhere outside the red area of the fan chart. Over the forecast period, this has been depicted by the light grey background. See the box on pages 48–49 of the May 2002 *Inflation Report* for a fuller description of the fan chart and what it represents.

**Chart 5.3** CPI inflation projection in November based on market interest rate expectations, other policy measures as announced



**Table 5.A** Forecast summary<sup>(a)(b)</sup>

	Projections			
	2016	2017	2018	2019
GDP <sup>(c)</sup>	2.2 (2.2)	2.0 (1.4)	1.6 (1.5)	1.7 (1.6)
Excluding backcast <sup>(d)</sup>	2.0 (2.1)	2.0 (1.4)	1.6 (1.5)	1.7 (1.6)
	2017 Q1	2018 Q1	2019 Q1	2020 Q1
CPI inflation <sup>(e)</sup>	2.0 (1.8)	2.7 (2.8)	2.6 (2.6)	2.4
LFS unemployment rate	4.9 (5.0)	5.0 (5.5)	5.0 (5.6)	4.8
Bank Rate <sup>(f)</sup>	0.2 (0.2)	0.3 (0.2)	0.5 (0.3)	0.7

- (a) Modal projections for GDP, CPI inflation and LFS unemployment. Figures in parentheses show the corresponding projections in the November 2016 *Inflation Report*. Projections were only available to 2019 Q4 in November.
- (b) The February projections have been conditioned on the assumption that the stock of purchased gilts remains at £435 billion throughout the forecast period; the stock of purchased corporate bonds reaches £10 billion and remains there throughout the forecast period; and on the Term Funding Scheme (TFS); all three of which are financed by the issuance of central bank reserves. The November projections were conditioned on the same asset purchase and TFS assumptions.
- (c) Calendar-year growth in real GDP consistent with the modal projection for four-quarter growth in real GDP. The MPC's projections are based on its backcast for GDP.
- (d) Figure for 2016 shows the outturn.
- (e) Four-quarter inflation rate.
- (f) Per cent. The path for Bank Rate implied by forward market interest rates. The curves are based on overnight index swap rates.

regular assessment of aggregate supply-side conditions. In light of repeated downside surprises for wage growth in recent years, the best collective judgement of the Committee is that the sustainable rate of unemployment is lower than previously thought at 4½% (Key Judgement 3). The central judgement, around which there remains considerable uncertainty and a range of views among Committee members, implies a higher level of potential supply and hence a wider margin of slack in the economy at the start of the forecast period. That greater slack weighs on projected wage growth.

The outlook for supply also depends on the United Kingdom's post-Brexit trading arrangements and their impact on companies' operations. The projections in this *Report* continue to be conditioned on the average of a range of possible eventual outcomes for those arrangements. Given those different possible outcomes, uncertainty is assumed to remain elevated, albeit a little lower than in the November *Report*, weighing on investment though less so on consumption. Productivity grows at below historical average rates (Key Judgement 3). Taking demand and supply together, relative to the November projection, there is judged to be a little more slack in the economy at the start of the forecast period, but a little less by the end. The MPC judges that the balance of risks to the outlook for both GDP and potential supply growth lie to the downside in the second and third years of the forecast period.

CPI inflation has risen markedly over the past year and is judged likely to return to around the 2% target by February. Much of the rise to date reflects the elimination of past drags from food, energy and import prices, together with renewed rises in oil prices. The projected path for inflation over the next three years in large part reflects the impact of higher import prices following sterling's depreciation (Key Judgement 4). In the run-up to the February *Report*, the sterling exchange rate was 3% higher than three months

earlier, but still 18% below its late-2015 peak. Higher import prices are judged likely to have their greatest effect on CPI inflation in around a year's time, but still to be pushing inflation above the 2% target at the end of the forecast period, fully accounting for the overshoot (Chart 5.2). Following sterling's recent appreciation, the CPI projection is slightly lower than three months ago further out (Chart 5.3). The risks around the inflation projection are balanced, with substantial risks on both sides around the outlook for wage growth and hence domestic inflationary pressures (Key Judgement 3).

The expectations for the economy, set out above and summarised in Table 5.A, are conditioned on asset prices in the fifteen days to 25 January. These imply a path for Bank Rate that rises to just under ¾% by early 2020, around 30 basis points higher than the November Report path (Table 5.B).<sup>(1)</sup> In recent months, longer-term market interest rates — such as those on UK government debt — have risen further, alongside similar moves in other advanced economies. Estimated spreads over reference rates for household borrowing fell and non-price terms for consumer credit also improved (Section 1). The FTSE All-Share index rose by 3% on the quarter.

At its meeting ending on 1 February 2017, the MPC voted to maintain Bank Rate at 0.25%, to continue with the programme of sterling non-financial investment-grade corporate bond purchases, financed by the issuance of central bank reserves, totalling up to £10 billion and to maintain the stock of UK government bond purchases, financed by the issuance of central bank reserves, at £435 billion. The factors behind that decision are set out in the Monetary Policy Summary on pages i–ii of this Report, and in more detail in the Minutes of the meeting.<sup>(2)</sup> The remainder of this section sets out the MPC's projections, and the risks around them, in more detail.

## 5.1 The MPC's key judgements and risks

### Key Judgement 1: UK trade will be supported by the past depreciation of the sterling exchange rate and the expected pickup in global growth

The latest activity indicators suggest more momentum in the advanced economies around the turn of the year than expected three months ago. Indicators of inflation have risen, in part reflecting increases in oil and other commodity prices, as well as some strengthening in core inflation. Moreover, it now

- (1) Unless otherwise stated, the projections shown in this section are conditioned on: Bank Rate following a path implied by market yields; the Term Funding Scheme (TFS) financed by the issuance of central bank reserves; the stock of purchased gilts financed by the issuance of central bank reserves remaining at £435 billion throughout the forecast period; the stock of purchased corporate bonds financed by the issuance of central bank reserves reaching £10 billion and remaining there throughout the forecast period; the Recommendations of the Financial Policy Committee and the current regulatory plans of the Prudential Regulation Authority; the Government's tax and spending plans as set out in the November 2016 Autumn Statement; commodity prices following market paths; and the sterling exchange rate remaining broadly flat. The main assumptions are set out in a table at [www.bankofengland.co.uk/publications/Documents/inflationreport/2017/febca.pdf](http://www.bankofengland.co.uk/publications/Documents/inflationreport/2017/febca.pdf).
- (2) The Minutes are available at [www.bankofengland.co.uk/publications/minutes/Documents/mpc/pdf/2017/feb.pdf](http://www.bankofengland.co.uk/publications/minutes/Documents/mpc/pdf/2017/feb.pdf).

**Table 5.B** Conditioning path for Bank Rate implied by forward market interest rates<sup>(a)</sup>

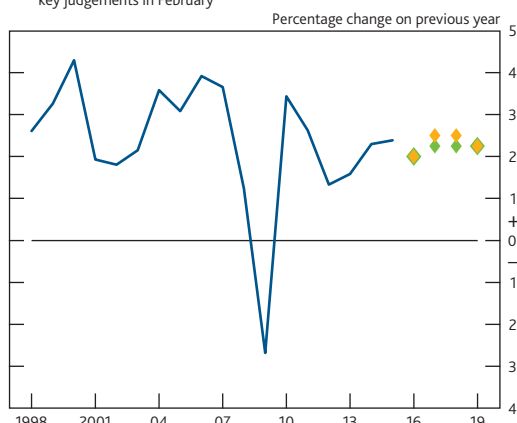
Per cent	2017				2018				2019				2020
	Q1 <sup>(b)</sup>	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
February	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7
November	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	

(a) The data are fifteen working day averages of one-day forward rates to 25 January 2017 and 26 October 2016 respectively. The curve is based on overnight index swap rates.

(b) February figure for 2017 Q1 is an average of realised overnight rates to 25 January 2017, and forward rates thereafter.

**Chart 5.4** World GDP (UK-weighted)<sup>(a)</sup>

- ◆ Projection at the time of the November Report
- ◆ Projection consistent with MPC key judgements in February



Sources: IMF *World Economic Outlook* and Bank calculations.

(a) Calendar-year growth rates. Chained-volume measure. Constructed using real GDP growth rates of 180 countries weighted according to their shares in UK exports.

**Table 5.C MPC key judgements<sup>(a)(b)</sup>**

**Key Judgement 1: UK trade will be supported by the past depreciation of the sterling exchange rate and the expected pickup in global growth**

	Average 1998– 2007	Projections			
		2016	2017	2018	2019
World GDP (UK-weighted) <sup>(c)</sup>	3	2 (2)	2½ (2¼)	2½ (2¼)	2¼ (2¼)
World GDP (PPP-weighted) <sup>(d)</sup>	4¼	3 (3)	3½ (3½)	3½ (3½)	3½ (3½)
Euro-area GDP <sup>(e)</sup>	2¼	1¾ (1½)	2 (1¾)	1¾ (1¾)	1½ (1¼)
US GDP <sup>(f)</sup>	3	1½ (1½)	2¼ (2¼)	2¼ (2)	2 (1¾)

**Key Judgement 2: weak real income growth weighs on UK domestic demand**

	Average 1998– 2007	Projections			
		2016	2017	2018	2019
Credit spreads <sup>(g)</sup>	¾ <sup>(h)</sup>	2¼ (2¼)	2 (2¼)	2 (2¼)	2 (2)
Household saving ratio <sup>(i)</sup>	8	5¾ (4¾)	4½ (4)	3¾ (4¼)	3¼ (4)
Business investment to GDP ratio <sup>(j)</sup>	9½	9¼ (9¼)	9¼ (9)	9 (9)	9¼ (9¼)

**Key Judgement 3: slack in the labour market and weak productivity growth weigh on wage growth**

	Average 1998– 2007	Projections			
		2016	2017	2018	2019
Productivity <sup>(k)</sup>	2¼	¾ (1)	1¾ (1½)	1¼ (1½)	1¼ (1½)
Participation rate <sup>(l)</sup>	63	63½ (63¾)	63½ (63¾)	63¾ (63¾)	63¾ (63½)
Average hours <sup>(m)</sup>	32¼	32 (32)	32 (31¾)	32 (31¾)	31¾ (31¾)
Unit labour costs <sup>(n)</sup>	3	2¼ (2¼)	2 (1¾)	2¼ (2½)	2¾ (3)

**Key Judgement 4: higher import prices take inflation above the 2% target for a period**

	Average 1998– 2007	Projections			
		2016	2017	2018	2019
Dollar oil prices <sup>(o)</sup>	39	50 (51)	57 (56)	57 (57)	57 (59)
UK import prices <sup>(p)</sup>	¼	9¾ (10¾)	4¾ (4¾)	1¾ (2)	¾ (1¼)

Sources: Bank of America Merrill Lynch Global Research (used with permission), Bank of England, BDR Continental *SME Finance Monitor*, Bloomberg, British Household Panel Survey, Department for Business, Energy and Industrial Strategy, Eurostat, IMF *World Economic Outlook (WEO)*, ONS, US Bureau of Economic Analysis and Bank calculations.

- (a) The MPC's projections for GDP growth, CPI inflation and unemployment (as presented in the fan charts) are underpinned by four key judgements. The mapping from the key judgements to individual variables is not precise, but the profiles in the table should be viewed as broadly consistent with the MPC's key judgements.
- (b) Figures show calendar-year growth rates unless otherwise stated. Figures in parentheses show the corresponding projections in the November 2016 *Inflation Report*. Calculations for back data based on ONS data are shown using ONS series identifiers.
- (c) Chained-volume measure. Constructed using real GDP growth rates of 180 countries weighted according to their shares in UK exports.
- (d) Chained-volume measure. Constructed using real GDP growth rates of 181 countries weighted according to their shares in world GDP using the IMF's purchasing power parity (PPP) weights.
- (e) Chained-volume measure. Figure for 2016 is an outturn.
- (f) Chained-volume measure. Figure for 2016 is an outturn.
- (g) Level in Q4. Percentage point spread over reference rates. Based on a weighted average of household and corporate loan and deposit spreads over appropriate risk-free rates. Indexed to equal zero in 2007 Q3. Figure for 2016 is the Q4 outturn.
- (h) Based on the weighted average of spreads for households and large companies over 2003 and 2004 relative to the level in 2007 Q3. Data used to construct the SME spread are not available for that period. The period is chosen as broadly representative of one where spreads were neither unusually tight nor unusually loose.
- (i) Calendar-year average. Percentage of total available household resources.
- (j) Calendar-year average. Chained-volume business investment as a percentage of GDP.
- (k) GDP per hour worked. GDP at market prices is based on the mode of the MPC's backcast.
- (l) Level in Q4. Percentage of the 16+ population.
- (m) Level in Q4. Average weekly hours worked, in main job and second job.
- (n) Four-quarter growth in unit labour costs in Q4. Whole-economy total labour costs divided by GDP at market prices, based on the mode of the MPC's GDP backcast. Total labour costs comprise compensation of employees and the labour share multiplied by mixed income.
- (o) Average level in Q4. Dollars per barrel. Projection based on monthly Brent futures prices. Figure for 2016 is the Q4 outturn.
- (p) Four-quarter inflation rate in Q4.

seems likely that the support from fiscal policy over the forecast period will be greater in a number of economies. That stronger outlook has been reflected in notable rises in global interest rates and equity prices. The MPC's projections incorporate a pickup in global growth in 2017, although it remains below average rates throughout the forecast period (**Chart 5.4**) and the risks to the outlook remain skewed to the downside.

In the United States, four-quarter growth has strengthened broadly as expected in November, supported by robust retail spending growth. A range of indicators including sharp rises in business and consumer confidence point to strengthening underlying demand. In addition, the fiscal plans of the new administration are likely to provide more support than incorporated in the November projections. Acting in the other direction, market prices suggest a path for interest rates that rises by ¾ percentage point more than the path three months ago and the US dollar has appreciated by 4%. Overall, US growth is projected to pick up to around 2¼% this year and next before slowing a little in 2019 (**Table 5.C**). There is considerable uncertainty about the US outlook as the details of any fiscal package and other economic policies are yet to be announced.

Activity and consumer spending data in the euro area have also shown signs of further improvement. GDP Growth is projected to average 1¾% throughout the forecast period (**Table 5.C**), with continued support from monetary policy and a slightly looser fiscal stance than in November. That is associated with a further fall in unemployment and inflation at only 1.6% in 2019.

The outlook for emerging market economies (EMEs) remains subdued. Taken together, growth in EMEs is likely to pick up a little as Russia and Brazil come out of recession. In China, data have remained robust but financial conditions have tightened and net capital outflows have increased again (Section 1). Growth in China is projected to slow slightly to around 6% over the forecast period, the same outlook as three months ago. The risks around that remain to the downside given the rapid expansion of domestic credit that has accompanied recent growth and the recent acceleration in net capital outflows.

The global outlook is a little more supportive for UK exports, and hence net trade, than three months ago. The recent rise in the sterling exchange rate, if it persists, will provide some offset. As in November, companies here and abroad are projected to begin to adjust some of their activities in light of Brexit, weighing on gross trade flows. The depreciation of sterling relative to late 2015 provides some support to exporters, however, and reduces demand for imports, so that net trade boosts growth for much of the forecast period. Given an improving trade balance and a further decline in the



**Table 5.D** Indicative projections consistent with the MPC's modal projections<sup>(a)</sup>

	Average 1998– 2007	Projections			
		2016	2017	2018	2019
Household consumption <sup>(b)</sup>	3½	2¾ (2¾)	2 (1¼)	1 (¾)	1¼ (1¼)
Business investment <sup>(c)</sup>	2½	-1¼ (-2)	-¾ (-1¾)	1¼ (2)	3¼ (4)
Housing investment <sup>(d)</sup>	3¾	4 (4¾)	3 (¾)	2 (1¾)	1 (2)
Exports <sup>(e)</sup>	4½	1¼ (2¾)	2½ (2)	1 (1)	½ (½)
Imports <sup>(e)</sup>	6	2½ (3¼)	1½ (¾)	-¼ (-1)	-¼ (-¾)
Real post-tax household income <sup>(f)</sup>	3	2 (1¼)	¾ (½)	¼ (1)	¾ (1)
Employment <sup>(g)</sup>	1	1 (1)	½ (0)	½ (¾)	¾ (½)
Average weekly earnings <sup>(h)</sup>	4¼	2¾ (2½)	3 (2¾)	3¼ (3¾)	3¼ (3¾)

(a) These projections are produced by Bank staff for the MPC to be consistent with the MPC's modal projections for GDP growth, CPI inflation and unemployment. Figures show calendar-year growth rates unless otherwise stated. Figures in parentheses show the corresponding projections in the November 2016 Inflation Report.

(b) Chained-volume measure. Includes non-profit institutions serving households.

(c) Chained-volume measure.

(d) Chained-volume measure. Whole-economy measure. Includes new dwellings, improvements and spending on services associated with the sale and purchase of property.

(e) Chained-volume measure. The historical data exclude the impact of missing trader intra-community (MTIC) fraud.

(f) Total available household resources deflated by the consumer expenditure deflator.

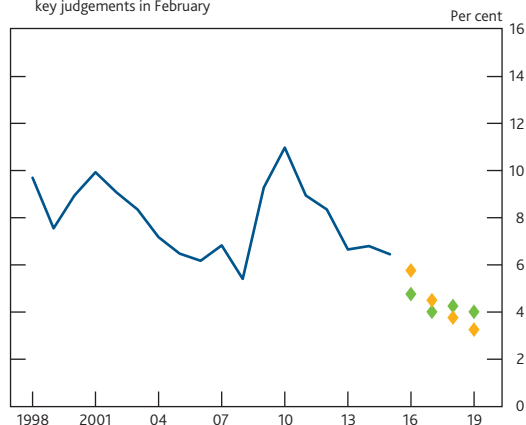
(g) Four-quarter growth rate in Q4.

(h) Four-quarter growth in Q4 in whole-economy total pay.

**Chart 5.5** Household saving ratio<sup>(a)</sup>

◆ Projection at the time of the November Report

◆ Projection consistent with MPC key judgements in February



Sources: ONS and Bank calculations.

(a) Calendar-year average. Percentage of total available household resources.

income deficit, the current account deficit is projected to shrink to around 3% of GDP by the end of the forecast period. Uncertainties around these paths stem from the possibility of further moves in the exchange rate and news about trading arrangements.

### Key Judgement 2: weak real income growth weighs on UK domestic demand

Domestic demand growth has been stronger than anticipated in the summer, when heightened uncertainty and the prospect of weaker income growth were judged likely to weigh on spending growth quite quickly. This expectation was informed by evidence from surveys at the time, which pointed to a contraction in overall activity. Quarterly household consumption growth was resilient over 2016, with little sign yet of any drags from uncertainty or a prospective weakening in real income. Nevertheless, a number of factors are projected to weigh on real income growth over the forecast period, including higher prices for imported goods and services, the prospect of only modest productivity growth and the fiscal consolidation, albeit to a slightly lesser degree than under previous fiscal plans (Section 2). Household real income is projected to be broadly flat over 2017 (Table 5.E), and four-quarter consumer spending growth is judged likely to slow in response, albeit a little more gradually than assumed in November (Table 5.D). Income and consumption growth pick up modestly in the second half of the forecast period, but to well below pre-crisis average rates.

There remains uncertainty about the extent and timing of the slowdown in consumption growth. The MPC's projections incorporate a significant fall in the saving ratio over the next three years (Chart 5.5) as consumers take time to adjust spending growth to weaker income flows. There are two-sided risks around that profile. The saving ratio could fall more sharply, in the near term at least, supporting growth. Consumer credit has been expanding at a robust pace in recent quarters, and it is possible that households will take advantage of relatively low borrowing costs to maintain a higher rate of consumption growth even as income growth stalls. If, however, households react more sharply to uncertainty or the prospect of weaker income growth, they may be unwilling to reduce their saving rates to the extent projected.

The housing market also surprised to the upside over the second half of 2016 (Section 2). Over the forecast period, weak real income growth and elevated uncertainty weigh on housing market activity so that real housing investment growth slows, and annual house price inflation drops back to just over 3½%.

Resilient household spending over 2016 contrasts with a fall in business investment. Business investment was estimated to be 2% lower than a year earlier in 2016 Q3 and surveys suggest that it will remain subdued, especially in the service

**Table 5.E** Monitoring risks to the Committee's key judgements

The Committee's projections are underpinned by four key judgements. Risks surround all of these, and the MPC will monitor a broad range of variables to understand the degree to which the risks are crystallising. The table below shows

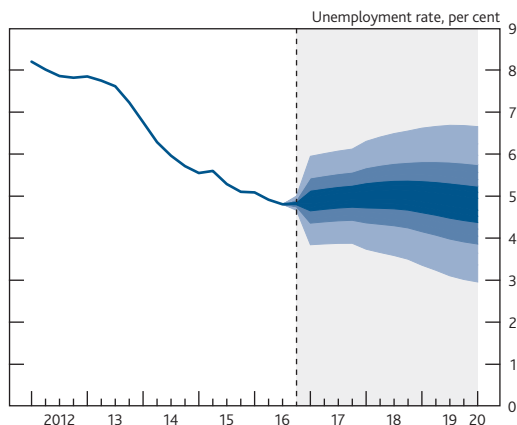
Bank staff's indicative near-term projections that are consistent with the judgements in the MPC's central view evolving as expected.

Key judgement	Likely developments in 2017 Q1 to 2017 Q3 if judgements evolve as expected
<b>1: UK trade will be supported by the past depreciation of the sterling exchange rate and the expected pickup in global growth</b>	<ul style="list-style-type: none"> <li>• Quarterly euro-area growth to average around ½%.</li> <li>• Annual euro-area HICP inflation to be a little above 1½%.</li> <li>• Quarterly US GDP growth to average a little above ½%.</li> <li>• Annual US PCE inflation to pick up to around 2%.</li> <li>• Indicators of activity consistent with four-quarter PPP-weighted emerging market economy growth of around 4¼%; within that, GDP growth in China to average around 6½%.</li> <li>• Net trade provides a small boost to real GDP growth.</li> <li>• The current account deficit narrows to around 4% of GDP.</li> </ul>
<b>2: weak real income growth weighs on UK domestic demand</b>	<ul style="list-style-type: none"> <li>• Quarterly growth in household real post-tax income to average 0%.</li> <li>• Quarterly consumption growth to average around ½% in 2017 H2, slowing to ¼% in Q3.</li> <li>• The saving rate declines towards 4%.</li> <li>• Credit spreads to be broadly flat.</li> <li>• Mortgage approvals for house purchase to be around 71,000 per month, on average.</li> <li>• The average of the Halifax and Nationwide price indices to increase by 1¼% per quarter, on average.</li> <li>• Quarterly growth in housing investment to average ¾%.</li> <li>• Business investment is projected to fall by around ¼% per quarter, on average.</li> </ul>
<b>3: slack in the labour market and weak productivity growth weigh on wage growth</b>	<ul style="list-style-type: none"> <li>• Participation rate to remain around its current level of just above 63½%.</li> <li>• Unemployment rate to rise to 5%.</li> <li>• Average hours to be broadly flat.</li> <li>• Quarterly hourly labour productivity growth slowing to just above ¼%.</li> <li>• Four-quarter growth in AWE regular pay to reach 3%.</li> <li>• Four-quarter growth in whole-economy unit labour costs slows temporarily to just under 1½%.</li> </ul>
<b>4: higher import prices take inflation above the 2% target for a period</b>	<ul style="list-style-type: none"> <li>• Commodity prices and sterling ERI to evolve in line with the conditioning assumptions set out in <a href="http://www.bankofengland.co.uk/publications/Documents/inflationreport/2017/febca.pdf">www.bankofengland.co.uk/publications/Documents/inflationreport/2017/febca.pdf</a>.</li> <li>• Electricity price rises to take place in Q2 and a slight fall in gas prices in Q1.</li> <li>• Annual growth in non-fuel import prices of almost 5% in the year to Q3.</li> <li>• Indicators of medium-term inflation expectations to continue to be broadly consistent with the 2% target.</li> </ul>

sector. It is likely that heightened uncertainty around the impact of the United Kingdom's withdrawal from the European Union is weighing on planned investment spending. Companies may also be scaling back some projects in light of higher prices for imported investment goods and the prospective slowdown in consumer demand. Business investment is projected to fall further over the first half of 2017 before growing modestly further out (**Table 5.D**). That is associated with very weak growth in the capital stock, relative to the past and expectations immediately prior to the EU referendum. The impact of Brexit remains the key risk to the outlook for investment, including companies' decisions on location, and expansion plans in the United Kingdom in light of new trading arrangements.

Overall, private domestic demand growth slows over 2017, led by a marked weakening in consumption growth, before recovering gradually further out. Private domestic demand

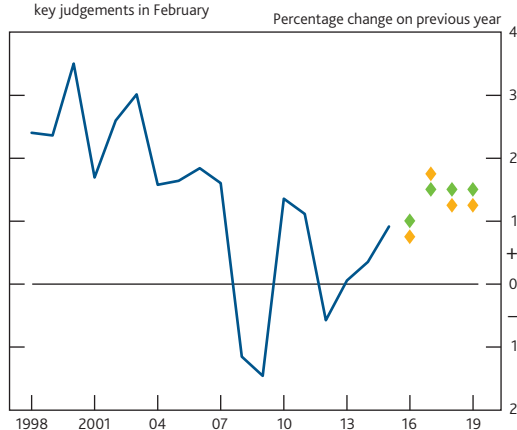
**Chart 5.6** Unemployment projection based on market interest rate expectations, other policy measures as announced



The fan chart depicts the probability of various outcomes for LFS unemployment. It has been conditioned on the assumptions in Table 5.A footnote (b). The coloured bands have the same interpretation as in Chart 5.2, and portray 90% of the probability distribution. The calibration of this fan chart takes account of the likely path dependency of the economy, where, for example, it is judged that shocks to unemployment in one quarter will continue to have some effect on unemployment in successive quarters. The fan begins in 2016 Q4, a quarter earlier than the fan for CPI inflation. That is because Q4 is a staff projection for the unemployment rate, based in part on data for October and November. The unemployment rate was 4.8% in the three months to November, and is projected to be 4.8% in Q4 as a whole. A significant proportion of this distribution lies below Bank staff's current estimate of the long-term equilibrium unemployment rate. There is therefore uncertainty about the precise calibration of this fan chart.

**Chart 5.7** Productivity<sup>(a)</sup>

◆ Projection at the time of the November Report  
◆ Projection consistent with MPC key judgements in February



Sources: ONS and Bank calculations.

(a) Calendar-year growth rates. GDP per hour worked. GDP is at market prices and projections are based on the mode of the MPC's backcast.

growth is stronger than in November in the first half of the forecast period. Total domestic demand is further boosted by the higher government spending plans set out in the Autumn Statement.

**Key Judgement 3: slack in the labour market and weak productivity growth weigh on wage growth**

After averaging over 4% prior to the crisis, wage growth has remained modest in 2015–16 at around 2%–3%. It has consistently been some way below the MPC's past projections (see the box on pages 18–20). As set out in previous *Reports*, weak wage growth in part reflects weak productivity growth. And over the past couple of years it is likely that low inflation has also played a role in limiting pay settlements. Notwithstanding these effects, the MPC had expected the fall in unemployment back to around its pre-crisis rate (Chart 5.6) to lead to a greater pickup in wage growth.

In its regular assessment of aggregate supply-side conditions, the MPC considered the continued weakness in wage growth alongside a broad range of other evidence on the labour market. As a result, it has lowered its view of the equilibrium unemployment rate from around 5% to 4½%. As well as helping to explain the recent weakness in wage growth, a lower equilibrium unemployment rate is also consistent with the rising average age of the workforce and increased degree of educational attainment, which are both characteristics that have tended to be associated with lower unemployment rates. Tax and benefit reforms over many years may also have lowered the equilibrium rate by increasing the incentive and ability to move from unemployment to employment. Moreover, as the labour market recovery has continued, long-term unemployment has continued to fall steadily, suggesting fewer constraints to these people returning to work. The MPC's updated estimate of 4½% is consistent with technical analysis of labour market data, and a range of models for wage growth, which point to estimates for the sustainable unemployment rate between 4% and 4¾%. The downward revision to the equilibrium rate lowers wage growth by just over 0.3 percentage points a year on average, and inflation by 0.2 percentage points in the second and third years of the forecast, other things equal. There is, however, significant uncertainty around the estimate of the equilibrium unemployment rate, which is unobservable, and there is a range of views among MPC members.

Since November, Bank staff have also assessed their estimates of broader measures of slack (Section 3). The latest data continue to point to labour market participation being close to its equilibrium rate. The estimated equilibrium level of average hours worked has been revised up somewhat. That means that the current rate of average hours worked is a touch below equilibrium — pointing to a degree of additional labour market slack — rather than a little above it as was the case in November. Offsetting the impact of that on overall

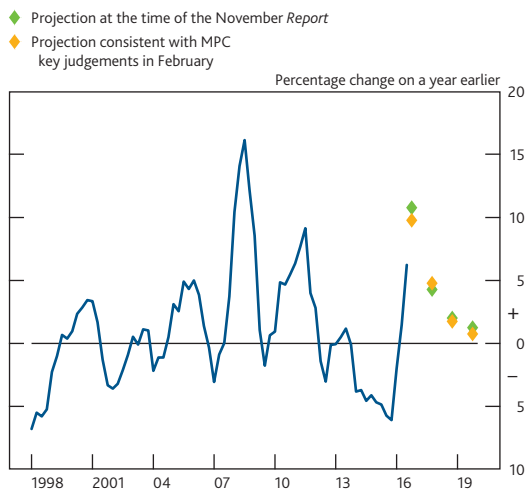
slack, there is judged to be less spare capacity within companies than assumed three months ago. That has implications for the productivity projection. In November, companies were judged to be operating with substantial spare capacity, which was worked off over the forecast period so productivity grew faster than its potential rate. The latest assessment suggests that companies are now operating with little spare capacity, so productivity grows in line with its potential over most of the forecast period.

The MPC's forecasts continue to assume subdued potential productivity growth over the forecast period, at a little over 1% a year. That partly reflects weak investment. In addition, expectations of a less open set of trading arrangements, for a period at least, are projected to weigh on potential productivity growth, given, for example, the gradual reorientation of business models that they will necessitate. Despite that weak underlying picture, the latest data suggest that measured hourly productivity growth rose sharply at the end of 2016, as hours worked fell against a continued expansion in output. That strength is assumed to be temporary (Section 3) and productivity growth is projected to drop back to its potential rate over the forecast period (Chart 5.7). The MPC judges that the balance of risks to the outlook for supply lie to the downside and that is reflected in the balance of risks around demand and hence the GDP profile as well.

Taken together, some degree of remaining slack in the economy and only modest productivity growth keep wage growth relatively subdued. The drag from slack eases slightly over the forecast period. The drag from past low inflation (Key Judgement 4) also dissipates over time. Overall, wage growth rises gradually to just under 3½% by early 2020, below its pre-crisis average rate and the November projection. Adjusting wages for the low rate of productivity growth, unit labour cost growth rises to rates consistent with inflation around the 2% target in the medium term (Table 5.C).

There is considerable uncertainty about the outlook for wage growth. The pace of demand growth will influence wage demands. On the supply side, a higher equilibrium unemployment rate than assumed would imply more upward pressure on companies' costs and prices from the central path for demand, or a lower one less pressure. Uncertainty also stems from the impact of the rise in headline inflation, especially if that leads inflation expectations to rise above historical averages (Key Judgement 4). It is also possible that higher bonus payments could raise aggregate wage growth temporarily following recent strength in profits, although this would have limited implications for companies' costs or inflation. The MPC will continue to monitor evidence on labour market slack and indicators of regular pay growth, which excludes bonuses, closely.

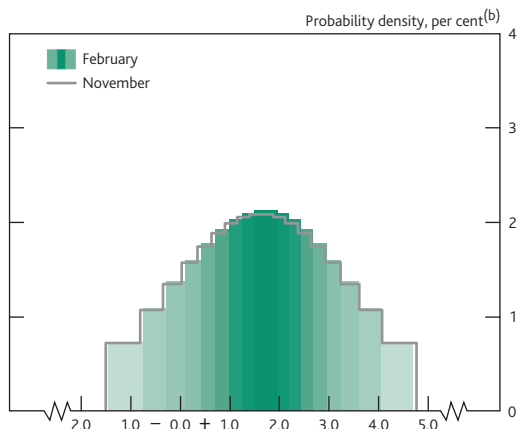
**Chart 5.8** Import price inflation<sup>(a)</sup>



Sources: ONS and Bank calculations.

(a) Projections are four-quarter inflation rate in Q4. Excludes the impact of MTIC fraud.

**Chart 5.9** Projected probabilities of GDP growth in 2019 Q1 (central 90% of the distribution)<sup>(a)</sup>



(a) Chart 5.9 represents the cross-section of the GDP growth fan chart in 2019 Q1 for the market interest rate projection. The grey outline represents the corresponding cross-section of the November 2016 *Inflation Report* fan chart for the market interest rate projection. The projections have been conditioned on the assumptions in Table 5.A footnote (b). The coloured bands in Chart 5.9 have a similar interpretation to those on the fan charts. Like the fan charts, they portray the central 90% of the probability distribution.

(b) Average probability within each band; the figures on the y-axis indicate the probability of growth being within  $\pm 0.05$  percentage points of any given growth rate, specified to one decimal place.

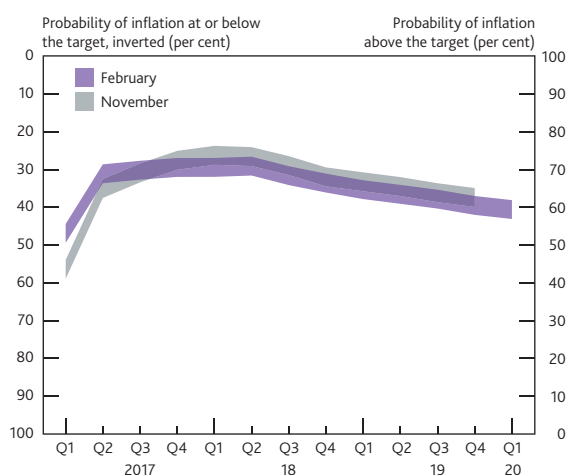
**Table 5.F** Calendar-year GDP growth rates of the modal, median and mean paths<sup>(a)</sup>

	Mode	Median	Mean
2017 <sup>(b)</sup>	2.0 (1.4)	2.0 (1.4)	2.0 (1.4)
2018	1.6 (1.5)	1.6 (1.5)	1.6 (1.5)
2019	1.7 (1.6)	1.6 (1.6)	1.6 (1.6)

(a) The table shows the projections for calendar-year growth of real GDP consistent with the modal, median and mean projections for four-quarter growth of real GDP implied by the fan chart. Where growth rates depend in part on the MPC's backcast, revisions to quarterly growth are assumed to be independent of the revisions to previous quarters. The figures in parentheses show the corresponding projections in the November 2016 *Inflation Report*. The projections have been conditioned on the assumptions in Table 5.A footnote (b).

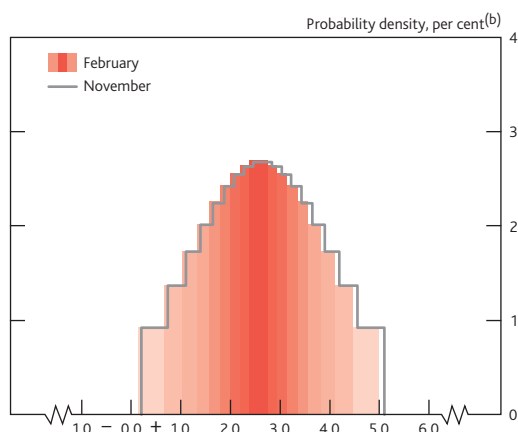
(b) The anticipated revisions to recent estimates of quarterly GDP growth do not have implications for calendar-year data shown in this table.

**Chart 5.10** Inflation probabilities relative to the target



The February and November swathes in this chart are derived from the same distributions as Charts 5.2 and 5.3 respectively. They indicate the assessed probability of inflation relative to the target in each quarter of the forecast period. The 5 percentage points width of the swathes reflects the fact that there is uncertainty about the precise probability in any given quarter, but they should not be interpreted as confidence intervals.

**Chart 5.11** Projected probabilities of CPI inflation in 2019 Q1 (central 90% of the distribution)<sup>(a)</sup>



(a) Chart 5.11 represents the cross-section of the CPI inflation fan chart in 2019 Q1 for the market interest rate projection. The grey outline represents the corresponding cross-section of the November 2016 *Inflation Report* fan chart for the market interest rate projection. The projections have been conditioned on the assumptions in Table 5.A footnote (b). The coloured bands in Chart 5.11 have a similar interpretation to those on the fan charts. Like the fan charts, they portray the central 90% of the probability distribution.

(b) Average probability within each band; the figures on the y-axis indicate the probability of inflation being within  $\pm 0.05$  percentage points of any given inflation rate, specified to one decimal place.

#### Key Judgement 4: higher import prices take inflation above the 2% target for a period

CPI inflation has risen markedly from close to zero in 2015 and is projected to be back around the 2% target by February, broadly as expected in November. The rise so far largely reflects external factors: the unwinding of drags from past falls in the prices of energy, food and other imported items, and some pass-through of recent rises in energy and food prices. A further rise in inflation above the target is expected as the 18% fall in sterling since November 2015 feeds through to higher retail prices.

The MPC assumes that the depreciation will push up import prices by around 10% in total. The impact of the fall in the pound is already apparent in indicators of import prices (Chart 5.8). Past experience suggests that retail prices will fully reflect these higher import costs over time, in line with the share of imports in consumption. As in November, the MPC judges that the size and source of the fall in sterling means that companies are likely to raise prices a little more quickly than they have done on average in response to past exchange rate moves. Despite that, higher import prices are still projected to be pushing inflation above the 2% target at the end of the forecast period. The contribution of import prices to CPI inflation rises to around 1 percentage point this year, before falling to around  $\frac{1}{2}$  percentage point by the end of the forecast period, and back towards zero a year or so later. There remains uncertainty about how much and how quickly the depreciation in sterling will feed through into CPI inflation.

There is also uncertainty about the broader impact of the rise in inflation. It is possible that a period of above-target inflation will have a greater effect on inflation expectations and wage growth than in the central projection (Key Judgement 3). To date, as inflation has picked up, shorter-term measures of inflation expectations have risen broadly in line with the MPC's own expectations. Having risen to around historical averages ahead of the November *Report*, financial market indicators of inflation expectations at longer horizons have been broadly stable, in contrast to rises in the United States and euro area (Section 1). The MPC continues to judge that inflation expectations remain well anchored but will monitor them closely as inflation rises above the 2% target.

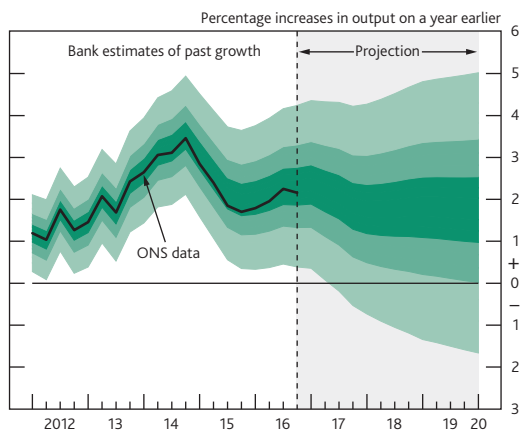
## 5.2 The projections for demand, unemployment and inflation

Based on these judgements and the risks around them, and under the path for Bank Rate based on market yields and the MPC's policy package, four-quarter GDP growth is projected to slow over 2017 and remain below average rates further out, although it is slightly above its potential rate in the third year of the forecast period. The slowing in growth reflects weakening consumption growth as households adapt to a period of very low real income growth.

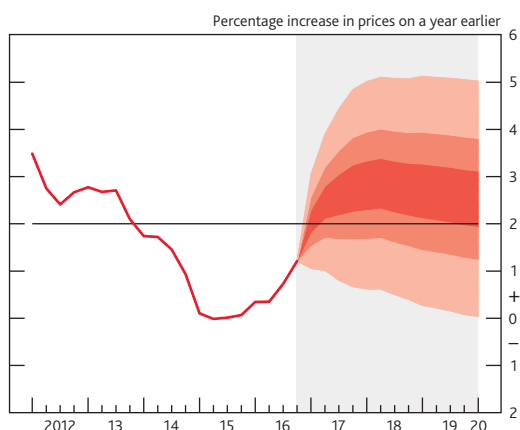
**Table 5.G** Q4 CPI inflation

	Mode	Median	Mean
2017 Q4	2.7 (2.7)	2.7 (2.8)	2.7 (2.8)
2018 Q4	2.6 (2.7)	2.6 (2.7)	2.6 (2.7)
2019 Q4	2.4 (2.5)	2.4 (2.5)	2.4 (2.5)

The table shows projections for Q4 four-quarter CPI inflation. The figures in parentheses show the corresponding projections in the November 2016 *Inflation Report*. The projections have been conditioned on the assumptions in Table 5.A footnote (b).

**Chart 5.12** GDP projection based on constant nominal interest rates at 0.25%, other policy measures as announced

See footnote to Chart 5.1.

**Chart 5.13** CPI inflation projection based on constant nominal interest rates at 0.25%, other policy measures as announced

See footnote to Chart 5.2.

The GDP projection is higher than that in the November *Report* (Table 5.F). That reflects the fiscal stimulus announced in the Chancellor's Autumn Statement, firmer momentum in global activity, higher global equity prices and more supportive UK credit conditions particularly for households. So far there have been relatively few signs of the slowdown in consumer spending that the Committee had anticipated following the EU referendum and the MPC now judges that households will take a little longer to adjust their spending. Overall, that leaves the level of GDP around 1% higher in three years' time than projected in November. As in November, the uncertainty around the central projection is judged to be greater than usual but the risks around the projection are skewed to the downside (Chart 5.9), reflecting the possibility that supply growth is more subdued than in the central projection in years two and three, which would weigh on demand.

That stronger central projection for demand has not led to significantly stronger inflationary pressure in these projections, reflecting the higher level of sterling and the MPC's regular assessment of aggregate supply-side conditions. That assessment has resulted in an upward revision to potential supply. In particular, a broad range of evidence points to the equilibrium unemployment rate being around ½ percentage point lower than previously assumed, at 4½%. In the latest projections, stronger demand growth means that the unemployment rate rises to only 5% (Chart 5.6), significantly lower than assumed in November, but the degree of economic slack is only a little smaller in the latest projections.

The main influence on the profile of CPI inflation over the forecast period remains the sterling exchange rate. Higher import prices are assumed to push inflation above the 2% target throughout the forecast period (Chart 5.10), though their contribution begins to fall back in 2018. That contribution, and hence the CPI inflation projection, is a little lower than three months ago (Chart 5.11) reflecting the 3% appreciation in sterling. There are substantial risks around the outlook for wage growth, and hence inflation, stemming from the assumptions about both demand and supply. A sharper pickup in wage growth could raise domestic inflationary pressure in the medium term, but if wage growth remains subdued, inflation could fall below the 2% target once the upward impetus from import prices washes out. Overall, however, the risks around the projection are judged to be balanced (Table 5.G).

Charts 5.12 and 5.13 show the MPC's projections under the alternative constant rate assumption, and the policy package announced by the MPC. That assumption is that Bank Rate remains at 0.25% throughout the three years of the forecast period, before rising towards the market path over the subsequent three years. Under that path, relative to the market rate profile, the growth and inflation projections are slightly higher.

## Other forecasters' expectations

This box reports the results of the Bank's most recent survey of external forecasters, carried out in January.<sup>(1)</sup> On average, respondents expected four-quarter GDP growth to slow materially over the coming year, before picking up to around 1¾% over the following two years (Table 1). That average GDP growth forecast was slightly stronger at the one year ahead horizon and slightly weaker further ahead, relative to expectations three months ago. When compared to the time of the *May Report*, before the EU referendum, the average of respondents' central projection for GDP growth in one year's time was more than 1 percentage point lower, and growth in three years' time was 0.3 percentage points lower (Chart A).

**Table 1** Averages of other forecasters' central projections<sup>(a)</sup>

	2018 Q1	2019 Q1	2020 Q1
CPI inflation <sup>(b)</sup>	2.8	2.4	2.1
GDP growth <sup>(c)</sup>	1.1	1.7	1.8
LFS unemployment rate	5.4	5.5	5.6
Bank Rate (per cent)	0.3	0.4	0.7
Stock of purchased gilts (£ billions) <sup>(d)</sup>	439	439	438
Stock of purchased corporate bonds (£ billions) <sup>(d)</sup>	10	10	10
Sterling ERI	77.6	78.3	78.9

Source: Projections of outside forecasters as of 26 January 2017.

- (a) For 2018 Q1, there were 25 forecasts for CPI inflation and GDP growth, 23 forecasts for Bank Rate, 20 for the unemployment rate, 18 for the stock of gilt purchases, 14 for the stock of corporate bond purchases and 11 for the sterling ERI. For 2019 Q1, there were 18 forecasts for CPI inflation and GDP growth, 20 for Bank Rate, 16 for the unemployment rate and the stock of gilt purchases, 12 for the stock of corporate bond purchases and 10 for the sterling ERI. For 2020 Q1, there were 18 forecasts for CPI inflation and GDP growth, 19 for Bank Rate, 16 for the unemployment rate, 15 for the stock of gilt purchases, 12 for the stock of corporate bond purchases and 9 for the sterling ERI.
- (b) Twelve-month rate.
- (c) Four-quarter percentage change.
- (d) Original purchase value. Purchased via the creation of central bank reserves.

**Chart A** External forecasters' GDP growth projections remain weaker than before the EU referendum  
Forecasters' central projections of GDP growth

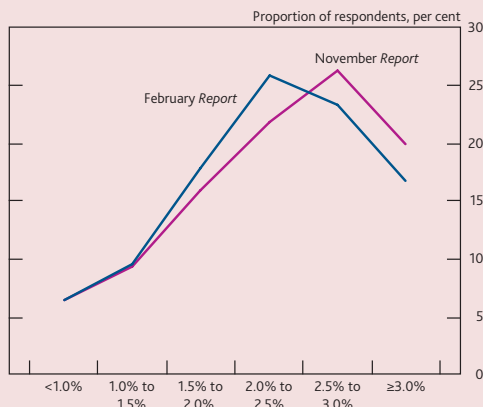


Sources: Projections of outside forecasters provided for *Inflation Reports* from February 2008 to February 2017.

On average, external forecasters thought there was a two-thirds probability of CPI inflation being at or above the 2% target in two years' time. That was broadly similar to their projections in November. However, the average weight placed

**Chart B** Expectations of inflation at or above 2.5% in two years' time have receded since November

Average probability of CPI inflation outturns in two years' time<sup>(a)</sup>



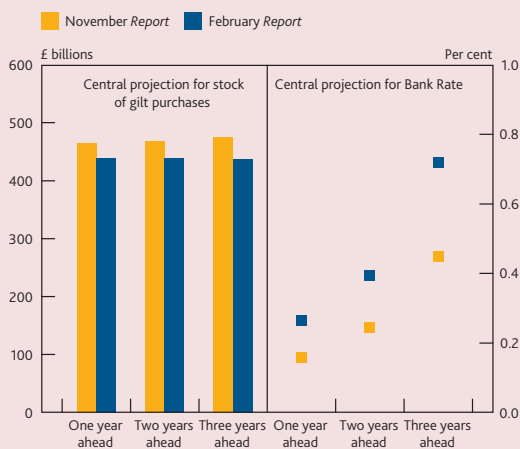
Sources: Projections of outside forecasters provided for *Inflation Reports* in November 2016 and February 2017.

- (a) Projections on the boundary of these ranges are included in the upper range, for example a projection of inflation being 2.0% is in the 2.0% to 2.5% range.

on inflation being at or above 2.5% at that horizon was slightly lower (Chart B).

External forecasters, on average, expected a slightly tighter monetary stance over the next three years compared with the time of the *November Report* (Chart C). The average of external forecasters' central projections was that Bank Rate would rise to around 0.7% by 2020 Q1 (Table 1). The stock of gilt purchases was expected, on average, to be close to the £435 billion announced in August. Respondents, on average, expected the stock of corporate bonds to be £10 billion over the forecast period, £2 billion less than expected at the time of the *November Report*.

**Chart C** External forecasters expect a slightly tighter monetary stance compared with three months ago  
Forecasters' central projections for the stock of gilt purchases and Bank Rate



Sources: Projections of outside forecasters provided for *Inflation Reports* in November 2016 and February 2017.

(1) For detailed distributions of other forecasters' expectations, see 'Other forecasters' expectations' on the Bank's website, available at [www.bankofengland.co.uk/publications/Documents/inflationreport/2017/febefe.pdf](http://www.bankofengland.co.uk/publications/Documents/inflationreport/2017/febefe.pdf).

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# Glossary and other information

## Glossary of selected data and instruments

**AWE** – average weekly earnings.  
**CDS** – credit default swap.  
**CPI** – consumer prices index.  
**CPI inflation** – inflation measured by the consumer prices index.  
**DGI** – domestically generated inflation.  
**DMP** – Decision Maker Panel.  
**ERI** – exchange rate index.  
**GDP** – gross domestic product.  
**HICP** – harmonised index of consumer prices.  
**LFS** – Labour Force Survey.  
**M4** – UK non-bank, non-building society private sector's holdings of sterling notes and coin, and their sterling deposits (including certificates of deposit, holdings of commercial paper and other short-term instruments and claims arising from repos) held at UK banks and building societies.  
**PCE** – personal consumption expenditure.  
**PMI** – purchasing managers' index.  
**RPI** – retail prices index.  
**RPI inflation** – inflation measured by the retail prices index.

## Abbreviations

**BCC** – British Chambers of Commerce.  
**CBI** – Confederation of British Industry.  
**CBPS** – Corporate Bond Purchase Scheme.  
**CEIC** – CEIC Data Company Ltd.  
**CEO** – chief executive officer.  
**CFO** – chief financial officer.  
**CIPS** – Chartered Institute of Purchasing and Supply.  
**CRE** – commercial real estate.  
**DB** – defined benefit.  
**EC** – European Commission.  
**ECB** – European Central Bank.  
**EME** – emerging market economy.  
**EU** – European Union.  
**FOMC** – Federal Open Market Committee.  
**FTSE** – Financial Times Stock Exchange.  
**GfK** – Gesellschaft für Konsumforschung, Great Britain Ltd.  
**GVA** – gross value added.

**IIF** – Institute of International Finance.  
**IMF** – International Monetary Fund.  
**MFIs** – monetary financial institutions.  
**MPC** – Monetary Policy Committee.  
**MSCI** – Morgan Stanley Capital International Inc.  
**MTIC** – missing trader intra-community.  
**NLW** – National Living Wage.  
**OECD** – Organisation for Economic Co-operation and Development.  
**OFCs** – other financial corporations.  
**ONS** – Office for National Statistics.  
**OPEC** – Organization of the Petroleum Exporting Countries.  
**PNFCs** – private non-financial corporations.  
**PPF** – Pension Protection Fund.  
**PPP** – purchasing power parity.  
**PwC** – PricewaterhouseCoopers.  
**RICS** – Royal Institution of Chartered Surveyors.  
**S&P** – Standard & Poor's.  
**SMEs** – small and medium-sized enterprises.  
**TFS** – Term Funding Scheme.  
**TPR** – The Pensions Regulator.  
**WEO** – IMF *World Economic Outlook*.

## Symbols and conventions

Except where otherwise stated, the source of the data used in charts and tables is the Bank of England or the Office for National Statistics (ONS) and all data, apart from financial markets data, are seasonally adjusted.

n.a. = not available.

Because of rounding, the sum of the separate items may sometimes differ from the total shown.

On the horizontal axes of graphs, larger ticks denote the first observation within the relevant period, eg data for the first quarter of the year.