

Inflation Report

November 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.

The Monetary Policy Committee:

Mark Carney, Governor

Ben Broadbent, Deputy Governor responsible for monetary policy

Jon Cunliffe, Deputy Governor responsible for financial stability

Dave Ramsden, Deputy Governor responsible for markets and banking

Andrew Haldane

Ian McCafferty

Michael Saunders

Silvana Tenreyro

Gertjan Vlieghe



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/nov.aspx.

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Monetary Policy Summary

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 November 2017, the MPC voted by a majority of 7–2 to increase Bank Rate by 0.25 percentage points, to 0.5%. The Committee voted unanimously to maintain the stock of sterling non-financial investment-grade corporate bond purchases, financed by the issuance of central bank reserves, at £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.

The MPC's outlook for inflation and activity in the November *Inflation Report* is broadly similar to its projections in August. In the MPC's central forecast, conditioned on the gently rising path of Bank Rate implied by current market yields, GDP grows modestly over the next few years at a pace just above its reduced rate of potential. Consumption growth remains sluggish in the near term before rising, in line with household incomes. Net trade is bolstered by the strong global expansion and the past depreciation of sterling. Business investment is being affected by uncertainties around Brexit, but it continues to grow at a moderate pace, supported by strong global demand, high rates of profitability, the low cost of capital and limited spare capacity.

CPI inflation rose to 3.0% in September. The MPC still expects inflation to peak above 3.0% in October, as the past depreciation of sterling and recent increases in energy prices continue to pass through to consumer prices. The effects of rising import prices on inflation diminish over the next few years, and domestic inflationary pressures gradually pick up as spare capacity is absorbed and wage growth recovers. On balance, inflation is expected to fall back over the next year and, conditioned on the gently rising path of Bank Rate implied by current market yields, to approach the 2% target by the end of the forecast period.

As in previous *Reports*, the MPC's projections are conditioned on the average of a range of possible outcomes for the United Kingdom's eventual trading relationship with the European Union. The projections also assume that, in the interim, households and companies base their decisions on the expectation of a smooth adjustment to that new trading relationship.

The decision to leave the European Union is having a noticeable impact on the economic outlook. The overshoot of inflation throughout the forecast predominantly reflects the effects on import prices of the referendum-related fall in sterling. Uncertainties associated with Brexit are weighing on domestic activity, which has slowed even as global growth has risen significantly. And Brexit-related constraints on investment and labour supply appear to be reinforcing the marked slowdown that has been increasingly evident in recent years in the rate at which the economy can grow without generating inflationary pressures.

Monetary policy cannot prevent either the necessary real adjustment as the United Kingdom moves towards its new international trading arrangements or the weaker real income growth that is likely to accompany that adjustment over the next few years. It can, however, support the economy during the adjustment process. The MPC's remit specifies that, in such exceptional circumstances, the Committee must balance any trade-off between the speed at which it intends to return inflation sustainably to the target and the support that monetary policy provides to jobs and activity.

The steady erosion of slack has reduced the degree to which it is appropriate for the MPC to accommodate an extended period of inflation above the target. Unemployment has fallen to a 42-year low and the MPC judges that the level of remaining slack is limited. The global economy is growing strongly, domestic financial conditions are highly accommodative and consumer confidence has remained resilient. In line with the framework set out at the time of the referendum, the MPC now judges it appropriate to tighten modestly the stance of monetary policy in order to return inflation sustainably to the target. Accordingly, the Committee voted by 7–2 to raise Bank Rate by 0.25 percentage points, to 0.5%. Monetary policy continues to provide significant support to jobs and activity in the current exceptional circumstances. All members agree that any future increases in Bank Rate would be expected to be at a gradual pace and to a limited extent.

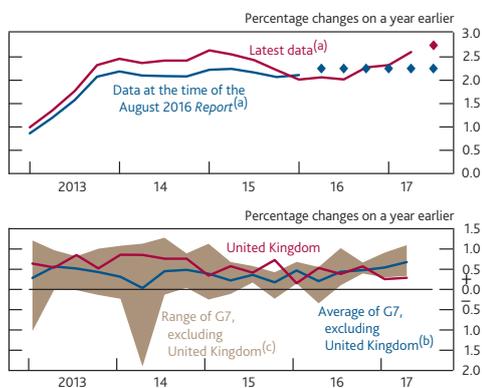
There remain considerable risks to the outlook, which include the response of households, businesses and financial markets to developments related to the process of EU withdrawal. The MPC will respond to developments as they occur insofar as they affect the behaviour of households and businesses, and the outlook for inflation. The Committee will monitor closely the incoming evidence on these and other developments, including the impact of today's increase in Bank Rate, and stands ready to respond to changes in the economic outlook as they unfold to ensure a sustainable return of inflation to the 2% target.

1 Global economic and financial market developments

The broad-based momentum in global growth has continued, and the outlook for the euro area in particular has strengthened. As growth has recovered, spare capacity in many countries is being absorbed. That strength has supported the prices of risky assets. Sterling remains significantly below its level prior to the EU referendum.

Chart 1.1 World GDP growth has strengthened by more than expected

UK-weighted world GDP and GDP in the G7 economies

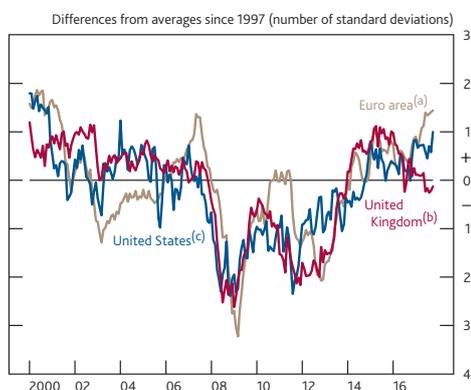


Sources: IMF *World Economic Outlook* (WEO), OECD, ONS, Thomson Reuters Datastream and Bank calculations.

- (a) Constructed using data for real GDP growth rates for 180 countries weighted according to their shares in UK exports. Diamonds are Bank staff projections, rounded to the nearest $\frac{1}{4}$ %. For the vast majority of countries, the latest observation was 2016 Q1 at the time of the August 2016 Report, and is 2017 Q2 in the latest data. For those countries where data are not yet available, Bank staff projections are used.
- (b) Real GDP growth in Canada, France, Germany, Italy, Japan and the United States. Latest observation is for 2017 Q2.
- (c) Unweighted average of real GDP growth in the countries listed in footnote (b).

Chart 1.2 US and euro-area consumer confidence remain healthy

Measures of UK, US and euro-area consumer confidence



Sources: European Commission (EC), GfK (research carried out on behalf of the EC), Thomson Reuters Datastream, University of Michigan and Bank calculations.

- (a) EC consumer confidence indicator. The composition of countries included in this indicator has changed over time to incorporate countries that joined the euro area after 1999.
- (b) Average of the net balances of respondents reporting that: their financial situation has got better over the past twelve months; their financial situation is expected to get better over the next twelve months; the general economic situation has got better over the past twelve months; the general economic situation is expected to get better over the next twelve months; and now is the right time to make major purchases, such as furniture or electrical goods.
- (c) University of Michigan consumer sentiment index. Data are not seasonally adjusted.

Global GDP growth has been steadily picking up over the past year and has been significantly stronger than projected in August 2016 (Chart 1.1). Growth in the G7, excluding the United Kingdom, strengthened further in Q2 broadly as projected three months ago (Section 1.1). A number of indicators point to a continuation of this strength in the near term. Survey indicators of output and new orders remain robust. Measures of business and consumer confidence (Chart 1.2) are also healthy, particularly in the euro area and United States. Part of the pickup in global growth can be accounted for by a recovery in investment growth. Capital goods orders have increased sharply (Chart 1.3). This should, in turn, support growth in the capital stock — the resources and equipment available to workers to produce output — and hence the outlook for activity further ahead.

The improvement in global growth and confidence since early 2016 has been an important factor supporting risky asset prices and financial conditions in many countries. Notwithstanding the firmer global backdrop, UK growth was modest in 2017 H1 (Chart 1.1 and Section 3) and market contacts report that investors remain cautious about the United Kingdom's relative growth prospects. While volatile, since the EU referendum the sterling ERI has remained 15%–20% below its late-2015 peak. In addition, the equity prices of UK-focused companies have underperformed their more globally orientated peers (Section 1.2).

1.1 Global economic developments

The euro area

Quarterly euro-area GDP growth was 0.6% in Q3 (Table 1.A), having strengthened in recent quarters (Chart 1.4). That pickup in growth has become increasingly broad-based across countries. Growth appears to have been supported by improving business and consumer confidence (Chart 1.2), alongside accommodative monetary policy and easing credit conditions. GDP growth is projected to remain a little above $\frac{1}{2}$ % in the near term, slightly stronger than projected three months ago and consistent with business survey

Chart 1.3 Capital goods orders have picked up
Capital goods orders in the United States and euro area^(a)



Sources: European Central Bank, Thomson Reuters Datastream, US Bureau of Labor Statistics, US Census Bureau and Bank calculations.

(a) Three-month moving average. Growth in US new orders for non-defence capital goods excluding aircraft, deflated by the private capital equipment producer price index, and euro-area volume of new orders for capital goods, weighted together using 2010 US and euro-area manufacturing value-added data.

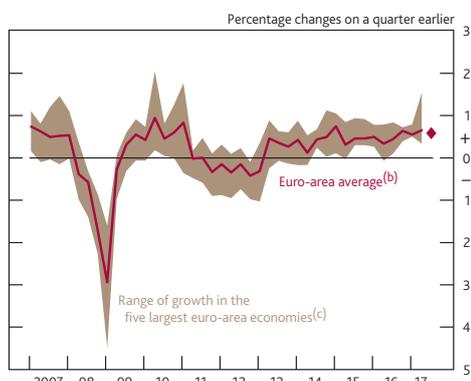
Table 1.A Global GDP growth remained strong in Q3
GDP in selected countries and regions^(a)

	Averages				2017		
	1998–2007	2012–13	2014–15	2016	Q1	Q2	Q3
United Kingdom	0.7	0.5	0.7	0.4	0.3	0.3	0.4
Euro area (38%)	0.6	0.0	0.4	0.5	0.6	0.7	0.6
United States (19%)	0.7	0.5	0.6	0.5	0.3	0.8	0.7
China (3%) ^(b)	2.5	1.9	1.7	1.7	1.4	1.8	1.7
Japan (2%)	0.3	0.4	0.1	0.4	0.3	0.6	n.a.
India (1%)	1.8	1.5	1.8	1.7	1.3	1.4	n.a.
Russia (1%) ^(c)	1.9	0.6	-0.4	0.1	0.4	1.1	n.a.
Brazil (1%)	0.8	0.6	-0.8	-0.6	1.0	0.2	n.a.
UK-weighted world GDP ^(d)	0.7	0.4	0.6	0.6	0.6	0.8	0.7

Sources: IMF WEO, National Bureau of Statistics of China, 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) The 1998–2007 average for China is based on OECD estimates. Estimates for 2008 onwards are from the National Bureau of Statistics of China.
 (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 2017 Q2. For those countries where data are not yet available, Bank staff projections are used.

Chart 1.4 The recovery in euro-area growth has become more broad-based
GDP in the euro area and the five largest euro-area economies^(a)



Source: Eurostat.

- (a) Chained-volume measures.
 (b) Weighted average of 19 euro-area economies. Diamond is preliminary flash estimate for Q3.
 (c) Includes the five largest euro-area economies by share of nominal euro-area GDP in 2016 (shares in parentheses): Germany (29%), France (21%), Italy (16%), Spain (10%) and Netherlands (7%).

indicators of activity, such as the IHS Markit purchasing managers' indices, which have remained around recent highs.

The recovery in demand has led to some slack in the labour market being absorbed. Euro-area unemployment was 8.9% in September, down from 9.9% a year earlier — although the extent of the fall in unemployment has varied across countries (Chart 1.5). With the recent pace of growth likely to be maintained, unemployment is projected to fall further.

Despite the fall in unemployment over the past year, wage growth has picked up only modestly. That may, in part, reflect the fact that measures of underemployment — which include people wanting to work more hours and those discouraged from searching for work — suggest that there is still some slack remaining in the labour market. It may also reflect a fall in recent years in the rate of unemployment consistent with stable wage and price pressures — the equilibrium unemployment rate. Long-term unemployment has fallen, although it remains above pre-crisis levels. The extensive labour market reforms implemented after the crisis in some countries, such as Greece, Portugal and Spain, are likely to have contributed to a decline in the equilibrium rate of unemployment as well. And labour market reforms recently proposed in France may help to lower structural unemployment somewhat further. The MPC judges that there is likely to be somewhat more slack in the euro area than previously assumed, and the projection for activity growth is therefore somewhat stronger than in August (Section 5).

Euro-area core inflation — which excludes the effects of energy and food prices — was 0.9% in October, below its historical average of 1.6% (Table 1.B). Headline inflation was 1.4% in October. Having pulled down headline inflation for much of 2015 and 2016, energy prices made a small positive contribution.

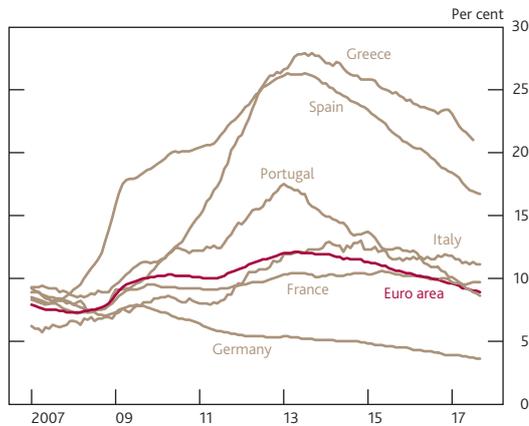
The United States

Quarterly US GDP growth has been broadly stable in recent years, averaging around ½% (Table 1.A). In recent quarters, more of that growth has been accounted for by business investment than over 2016. Growth in Q3 was 0.7%, stronger than had been projected three months ago. And growth is projected to remain at around those rates in the near term (Table 1.C).

Indicators suggest that there is probably little spare capacity remaining in the US economy. A variety of measures of labour market slack — including the unemployment rate, underemployment and the rate at which employees are voluntarily leaving jobs — are around, or approaching, their pre-crisis lows. That means that the pace at which activity can grow without putting upward pressure on inflation will be increasingly dependent on the pace of productivity growth. Having been weak in recent years, there are signs that labour

Chart 1.5 The extent of the fall in unemployment has varied across euro-area countries

Unemployment rates in the euro area^(a)



Source: Eurostat.

(a) Percentages of economically active population. Latest data points shown are for September 2017, except for Greece where the latest data point is for July.

Table 1.B Core inflation remains subdued in the euro area and United States

Inflation in selected countries and regions

Per cent	Monthly averages						2017			
	1998–2007	2015	2016 H1	2016 H2	2017 Q1	2017 Q2	July	Aug.	Sep.	Oct.
Annual headline consumer price inflation										
United Kingdom	1.6	0.0	0.4	1.0	2.1	2.7	2.6	2.9	3.0	n.a.
Euro area ^(a)	2.0	0.0	0.0	0.5	1.8	1.5	1.3	1.5	1.5	1.4
United States ^(b)	2.0	0.3	1.0	1.4	2.0	1.6	1.4	1.4	1.6	n.a.
UK-weighted world inflation ^(c)	2.0	0.5	0.7	0.9	1.6	1.5	n.a.	n.a.	1.5	n.a.
Annual core consumer price inflation (excluding food and energy)^(d)										
United Kingdom	1.2	1.1	1.3	1.4	1.8	2.5	2.4	2.7	2.7	n.a.
Euro area ^(a)	1.6	0.8	0.9	0.8	0.8	1.1	1.2	1.2	1.1	0.9
United States ^(b)	1.8	1.3	1.7	1.9	1.8	1.5	1.4	1.3	1.3	n.a.
Annual UK-weighted world export price inflation excluding oil^(c)										
	1.1	-0.9	-2.9	-0.8	3.3	2.9	n.a.	n.a.	2.4	n.a.

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

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

(b) Personal consumption expenditure price index inflation. Data points for September 2017 are preliminary estimates.

(c) UK-weighted world consumer price inflation is constructed using data for consumption deflators for 51 countries, weighted according to their shares in UK exports. UK-weighted world export price inflation excluding oil is constructed using data for non-oil export deflators for 51 countries, excluding major oil exporters, weighted according to their shares in UK exports. For the vast majority of countries, the latest observations are 2017 Q2. Where data are not yet available, Bank staff projections are used. Figures for September are Bank staff projections for 2017 Q3.

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

productivity growth has begun to pick up. Four-quarter hourly productivity in the non-farm business sector grew by 1.3% in Q2, compared with a fall of 0.4% a year earlier, although growth remains well below pre-crisis rates. Productivity growth should be supported by the recent rise in business investment, which will support growth in the capital stock.

Despite the narrowing in slack, wage growth and inflation have remained subdued in the United States. For example, growth in the Employment Cost Index measure of wages was 2.5% over the four quarters to 2017 Q3, up from around 2% in 2014–15. The headline inflation rate was 1.6% in September, and core inflation — excluding food and energy — was 1.3%, both around 0.5 percentage points below their historical averages (Table 1.B).

Emerging market economies

In China, GDP growth has been stable over the past two years (Table 1.A). In Q3, four-quarter headline GDP growth was 6.8%, down slightly from 6.9% in Q2. While the authorities have taken some measures to reduce financial sector leverage, and macroprudential policy measures have resulted in slowing house price inflation, activity growth has continued to be accompanied by rapid rises in credit. Annual total social financing growth has averaged around 13% over the past two years, and the outstanding stock of credit to the non-financial sector reached 258% of GDP in 2017 Q1. There remain challenges for the authorities in maintaining current rates of GDP growth while reducing risks to financial stability.⁽¹⁾

Growth in other emerging market economies (EMEs) has continued to recover over the past year, supported by: easier domestic financial conditions; the recovery in advanced-economy demand and world trade growth; and, for commodity exporters, the recovery in commodity prices since early 2016. Growth is projected to remain robust, notwithstanding some easing of monthly surveys of activity in 2017 Q3.

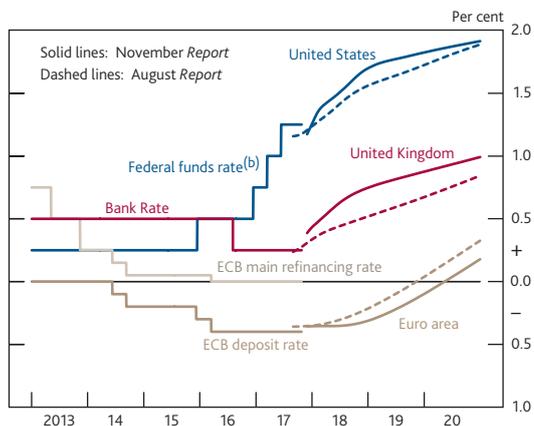
1.2 Developments in financial markets

The improvement in global growth and confidence has been an important factor supporting risky asset prices and financial conditions. Market interest rates in the United States and euro area have risen relative to 18 months ago, although they remain low by historical standards and market-implied paths continue to suggest that policy rates will rise only gradually in coming years. Heightened geopolitical tensions over the past few months do not appear to have had a significant effect on investor sentiment. Financial market-based measures of

(1) For more detail on financial vulnerabilities in China, see the June 2017 *Financial Stability Report*; www.bankofengland.co.uk/publications/Documents/fsr/2017/fsrjun17.pdf.

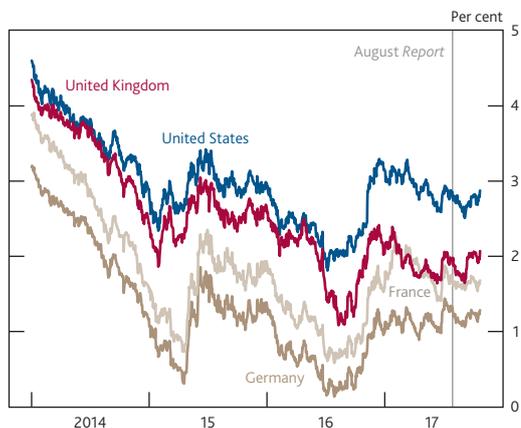
Table 1.C Monitoring the MPC's key judgements

Developments anticipated in August during 2017 Q3–2018 Q1	Developments now anticipated during 2017 Q4–2018 Q2
Advanced economies	Revised up
<ul style="list-style-type: none"> Quarterly euro-area growth to average a little above ½%. Quarterly US GDP growth to average ½%. 	<ul style="list-style-type: none"> Quarterly euro-area growth to average a little above ½%. Quarterly US GDP growth to average a little above ½%.
Rest of the world	Broadly unchanged
<ul style="list-style-type: none"> Average four-quarter PPP-weighted EME growth of around 4¾%; GDP growth in China to average around 6¾%. 	<ul style="list-style-type: none"> Average four-quarter PPP-weighted EME growth of around 4¾%; GDP growth in China to average a little above 6½%.
The exchange rate	Broadly unchanged
<ul style="list-style-type: none"> Sterling ERI to evolve in line with the conditioning assumptions. 	<ul style="list-style-type: none"> Sterling ERI to evolve in line with the conditioning assumptions.

Chart 1.6 The market-implied path for UK short-term interest rates has risenInternational forward interest rates^(a)

Sources: Bank of England, Bloomberg, ECB and Federal Reserve.

- (a) The November 2017 and August 2017 curves are estimated using instantaneous forward overnight index swap rates in the fifteen working days to 25 October and 26 July respectively.
 (b) Upper bound of the target range.

Chart 1.7 Longer-term interest rates remain higher than 18 months agoFive-year, five-year forward nominal interest rates^(a)

Sources: Bloomberg and Bank calculations.

- (a) Zero-coupon forward rates derived from government bond prices.

investor uncertainty and sentiment — such as implied volatilities — have remained at historically low levels.

Interest rates

At its September meeting, the MPC voted 7–2 to leave interest rates unchanged, and unanimously to maintain the stock of purchased assets (see the box on page 5). The Minutes of the meeting stated that, conditional on the economy evolving in such a way that slack continues to be eroded and underlying inflationary pressure rises, the majority of the MPC considered some withdrawal of monetary stimulus to be appropriate in coming months. Around the time of the announcement, market interest rates rose. In the run-up to the November *Report*, the market-implied path for Bank Rate reached 1% in three years' time, around 0.2 percentage points higher than at the time of the August *Report* (Chart 1.6). The details of the November 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.

In the United States, the Federal Open Market Committee (FOMC) has made no changes to its target range for the federal funds rate of 1% to 1¼% since the August *Report*. But it announced that it would begin to reduce the size of the Federal Reserve's balance sheet. During 2008–14, the balance sheet grew from around US\$800 billion to around US\$4.2 trillion in order to support the economy, largely through the purchase of government debt and mortgage-backed securities. The FOMC had maintained this stock by reinvesting the proceeds of maturing assets. From October onwards, however, a proportion of maturing assets will not be replaced — initially at the rate of up to US\$10 billion per month, increasing to US\$50 billion per month over the course of a year. As a consequence, the balance sheet will gradually shrink. The announcement had been widely anticipated by market contacts and appeared to have little effect on market interest rates. In the run-up to the November *Report*, the implied path for policy rates was slightly steeper than in August, having risen following stronger-than-expected economic data releases (Chart 1.6).

The European Central Bank (ECB) has made no changes to its policy rates since August. In October, however, it announced that, while it would continue its asset purchase programme until at least September 2018, it would reduce the pace of purchases from €60 billion to €30 billion per month from the beginning of 2018. There was limited market reaction to the announcement, suggesting that it was broadly in line with investors' expectations. In the run-up to the November *Report*, the market-implied path for policy rates was slightly flatter than in August (Chart 1.6).

Longer-term interest rates have changed little since the August *Report* (Chart 1.7), although they remain higher than 18 months ago in the United States and euro area. Some of

Monetary policy since the August Report

The MPC's central projection in the *August Report* was for sluggish GDP growth in the near term as the squeeze on households' real incomes weighed on consumption. Growth was then judged likely to pick up to just above its modest potential rate over the rest of the forecast period, supported by firming net trade and business investment and by a modest recovery in consumption growth. Inflation was projected to rise further above the target in the second half of 2017 as the pass-through of sterling's depreciation continued. Conditional on the path for Bank Rate implied by market interest rates prevailing at the time, inflation was projected to remain above the target throughout the forecast period. That central projection was also conditioned on the stocks of purchased gilts and corporate bonds remaining at £435 billion and £10 billion respectively.

At its meeting ending on 13 September 2017, the MPC noted that the relatively limited news on activity pointed, if anything, to a slightly stronger picture than anticipated. Employment growth had been resilient and, as a result, the unemployment rate had fallen to 4.3%. In addition, weak productivity growth had corroborated the MPC's forecast for modest potential supply growth. Overall, the latest indicators had been consistent with UK demand growth a little in excess of this diminished rate of potential supply growth, and pointed

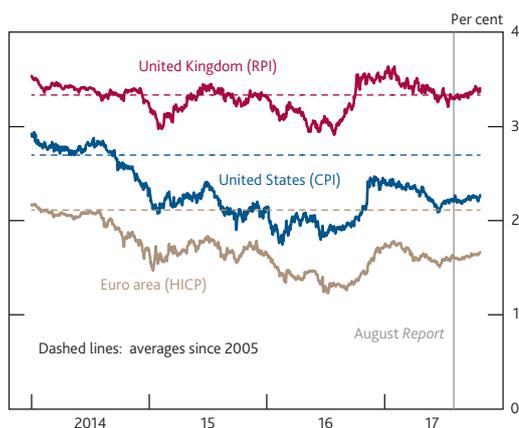
to the continued erosion of the remaining limited degree of spare capacity in the economy.

CPI inflation had risen to 2.9% in August, which was slightly higher than the MPC had anticipated at the time of the *August Report*. Developments in the oil market suggested greater near-term upward pressure on inflation from petrol prices, and CPI inflation was expected to rise above 3% in October.

All MPC members continued to judge that monetary policy could need to be tightened by a somewhat greater extent than the yield curve underpinning the August projections implied if the economy followed a path broadly consistent with those projections. In addition, a majority of Committee members judged that, if slack continued to be eroded and underlying inflationary pressure continued to gradually build in line with the August projections, then some withdrawal of monetary stimulus would be likely to be appropriate over the coming months in order to return inflation sustainably to the target. Seven members thought that the current policy stance remained appropriate to balance the demands of the MPC's remit. Two members considered it appropriate to increase Bank Rate by 25 basis points. All members agreed that any prospective increases in Bank Rate would be expected to be at a gradual pace and to a limited extent.

Chart 1.8 Inflation compensation has recovered somewhat since mid-2016

Five-year, five-year forward inflation compensation^(a)



Sources: Bloomberg and Bank calculations.

(a) Derived from interest rate swaps. The instruments used are linked to the UK RPI, US CPI and euro-area HICP measures of inflation respectively.

that increase reflects a recovery in inflation compensation (**Chart 1.8**), which in turn will reflect inflation expectations and the perceptions of risks around the outlook for inflation. Inflation compensation in the euro area and United States drifted lower from mid-2014, following the decline in global commodity prices and heightened concerns about the long-term outlook for global activity growth. Inflation compensation has since recovered, and is around its past average rate in the United Kingdom, although it remains somewhat below average in the United States and euro area.

Despite being higher than 18 months ago, long-term interest rates remain historically low. That probably reflects slow-moving structural factors, such as demographics, which are likely to continue to weigh on global interest rates for some time to come.⁽¹⁾ Consistent with this, market-implied paths continue to suggest that policy rates will rise only gradually in coming years (**Chart 1.6**), particularly in comparison to previous tightening cycles.⁽²⁾

(1) For further discussion, see the box on pages 8–9 of the November 2016 *Report*; www.bankofengland.co.uk/publications/Pages/inflationreport/2016/nov.aspx; Vlieghe, G (2016), 'Monetary policy expectations and long-term interest rates', www.bankofengland.co.uk/publications/Documents/speeches/2016/speech909.pdf; and Vlieghe, G (2017), 'Real interest rates and risk', www.bankofengland.co.uk/publications/Documents/speeches/2017/speech995.pdf.

(2) For more details, see Chart 1.2 of the May 2015 *Report*; www.bankofengland.co.uk/publications/Documents/inflationreport/2015/may.pdf.

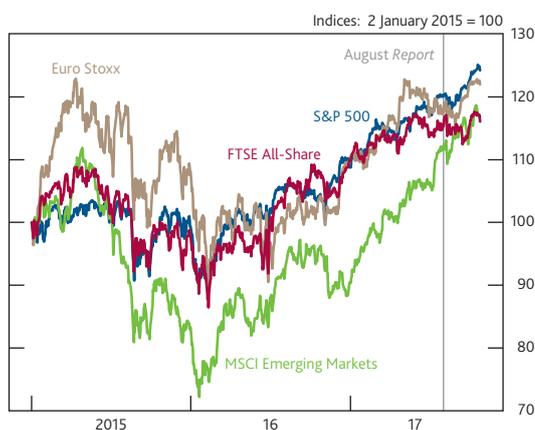
Chart 1.9 Sterling has remained 15%–20% below its late-2015 peak

Sterling exchange rates



Chart 1.10 International equity prices have risen further

International equity prices^(a)

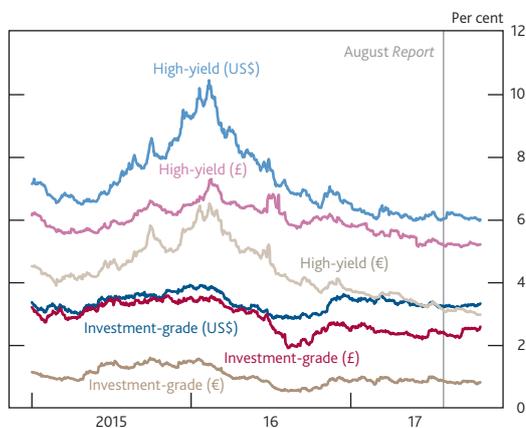


Sources: MSCI, Thomson Reuters Datastream and Bank calculations.

(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/nov.aspx.

Chart 1.11 Corporate bond yields remain well below their levels in early 2016

International non-financial corporate bond yields^(a)



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

(a) 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.

Exchange rates

Changes in relative prospects for growth and interest rates between countries tend to influence movements in exchange rates.⁽¹⁾ In the run-up to the November Report, notwithstanding some volatility, the value of sterling was broadly unchanged relative to three months ago (Chart 1.9). While the sterling exchange rate has fluctuated, since the EU referendum it has remained between 15%–20% below its November 2015 peak. Market contacts ascribe much of that fall to market participants having revised down UK growth prospects relative to those in the rest of the world.

Corporate capital markets

Developments in capital markets influence the ease and cost of raising finance for companies. These financing conditions have changed little since August, and remain more favourable than in early 2016, supported by the improvement in the global growth outlook (Section 1.1) and greater investor risk appetite. Consistent with that, financial market-based measures of investor uncertainty and sentiment — such as implied volatilities — remain historically low.⁽²⁾

International equity prices have risen since August (Chart 1.10). An important component of the cost of issuing equity is equity risk premia — the additional return that investors require for holding equities instead of less risky government debt. Risk premia for euro-area and US equities are estimated to have changed little since August, but remain considerably narrower than in early 2016 and are close to their lowest levels in ten years.

Similarly to equities, the risk premia on corporate bonds — the spread that investors require over and above government bond yields for the additional risk of holding these assets — is also broadly unchanged relative to three months ago, and remains lower than in early 2016. Although government bond yields have risen since 2016, spreads on corporate bonds have narrowed by more. So overall corporate bond yields have fallen (Chart 1.11), reducing the cost of bond financing for companies. That fall in the cost of debt has been particularly marked for 'high-yield' debt, which is issued by riskier companies.

Improvements in global risk sentiment do not appear, however, to have been matched in sterling markets. This is most obvious in equity markets. Much of the rise in the FTSE All-Share index since early 2016 (Chart 1.10) appears primarily to have reflected the decline in the exchange rate and its impact on the sterling value of profits earned on overseas operations. Consistent with that, equity prices of

(1) See Broadbent, B (2017), 'Brexit and the pound'; www.bankofengland.co.uk/publications/Documents/speeches/2017/speech969.pdf.

(2) For more detail on the factors that might have driven this, see the box on page 8 of the August 2017 Report; www.bankofengland.co.uk/publications/Documents/inflationreport/2017/aug.pdf.

Chart 1.12 The equity prices of UK-focused companies have underperformed relative to the overall index

Sterling ERI and UK domestically focused companies' equity prices relative to the FTSE All-Share

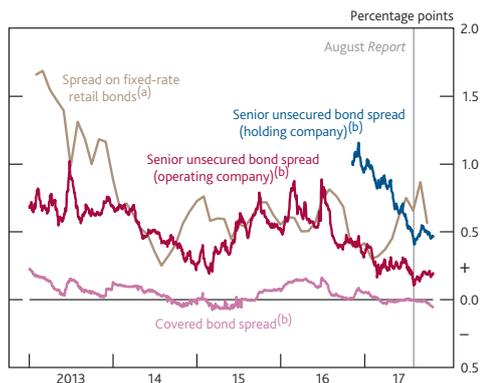


Sources: Bloomberg, Thomson Reuters Datastream and Bank calculations.

(a) UK domestically focused companies are those generating at least 70% of their revenues in the United Kingdom, based on annual financial accounts data on companies' geographic revenue breakdown.

Chart 1.13 UK bank funding spreads have narrowed significantly over the past year

UK banks' indicative longer-term funding spreads



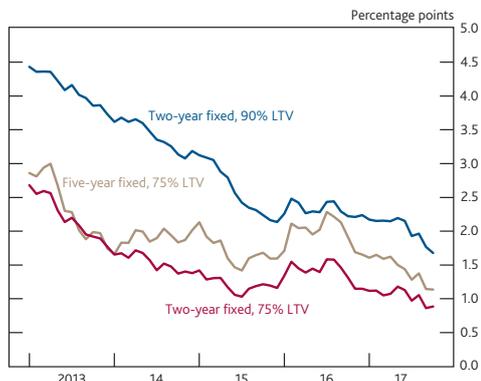
Sources: Bank of England, Bloomberg, IHS Markit and Bank calculations.

(a) 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.

(b) Constant-maturity unweighted average of secondary market spreads to mid-swaps for the major UK lenders' five-year euro-denominated bonds or a suitable proxy when unavailable. For more detail on unsecured bonds issued by operating and holding companies, see the 2017 Q3 *Credit Conditions Review*; www.bankofengland.co.uk/publications/Documents/creditconditionsreview/2017/ccrq317.pdf.

Chart 1.14 Mortgage spreads are narrower than a year ago

Spreads on average quoted mortgage rates^(a)



(a) Sterling-only end-month average quoted rates minus swap rates of equivalent maturity. Data are not seasonally adjusted. The Bank's quoted rates series are weighted averages of rates from a sample of banks and building societies with products meeting the specific criteria (see www.bankofengland.co.uk/statistics/Pages/iadb/notesiadb/household_int.aspx). October data are flash estimates of the provisional estimates, which will be published on 7 November.

UK-focused companies have underperformed relative to the overall index (Chart 1.12). Despite significant falls in the United States and euro area since early 2016, equity risk premia on the FTSE All-Share index are estimated to have been broadly unchanged.

Bank funding costs

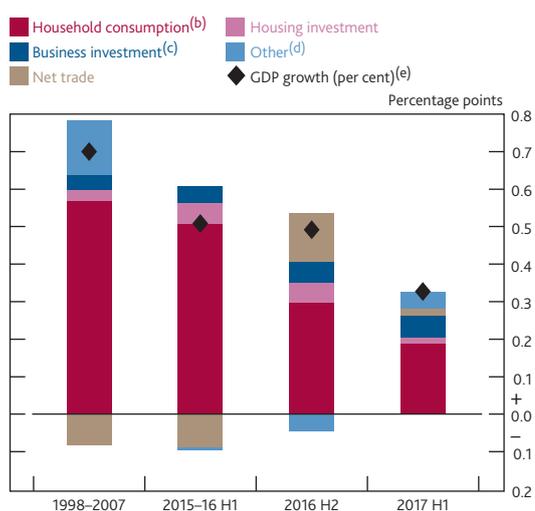
Capital markets also matter for broader credit conditions through their influence on bank funding costs. Although they have been broadly stable since August, the spreads that banks pay for funding over and above market interest rates have narrowed significantly over the past year (Chart 1.13). This has contributed to many retail interest rates faced by household and companies falling to historically low levels (Section 2), and by more than the fall in market rates (Chart 1.14). As explained in the box on pages 18–21, the recent rises in market interest rates are expected to feed through gradually into higher rates for households and companies, unwinding some of the recent declines in these retail rates. Market interest rates and bank funding costs, however, remain low by historical standards.

2 Demand

Consumption growth has slowed gradually since mid-2016, as sterling's depreciation has squeezed household real income growth. Consumption growth is projected to remain subdued in the near term before picking up gradually as that squeeze abates. Offsetting some of the weakness in consumption, business investment growth and net trade have risen, probably reflecting the depreciation and strong global demand. They should continue to support modest overall growth in the near term.

Chart 2.1 The slowing in consumption growth has been partly offset by stronger net trade and business investment

Contributions to average quarterly GDP growth^(a)



(a) Chained-volume measures.

(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) Calculated as a residual. Includes government consumption and investment, changes in inventories, the statistical discrepancy and acquisitions less disposals of valuables. Also includes the difference between the official estimate of GDP and the backcast for the final estimate of GDP.

(e) Backcast of the final estimate of GDP.

Sterling depreciated sharply following the EU referendum and, since then, has remained 15%–20% below its late-2015 peak (Section 1). That is raising UK import prices (Section 4) and weighing on growth in households' real income and spending. Set against that, the depreciation, along with the strength of global demand (Section 1), is also likely to be supporting growth in exports, exporters' profits and thus investment in export capacity. Consistent with these developments, following the latest data revisions the slowing in GDP growth since the referendum has been accounted for by a steady weakening in consumption growth (Chart 2.1). Partly offsetting that, business investment growth and net trade have picked up (Table 2.A).

Consumption growth is expected to remain subdued over the next year, before picking up gradually as real income growth recovers somewhat (Section 2.1). Housing investment should be supported by the recent stabilisation in activity and prices in the housing market (Section 2.2). In addition, the strength in global growth should continue to support business investment (Section 2.4) and net trade (Sections 2.5 and 2.6). The outlook for demand will, however, depend crucially on how households and companies anticipate and respond to the prospect of the United Kingdom's departure from the European Union.

2.1 Household spending

The impact of sterling's depreciation on inflation (Section 4) has weighed on households' purchasing power. Despite support from robust employment growth in recent quarters (Section 3), real pre-tax labour income is expected to have been flat over the year to 2017 Q3 (Chart 2.2). Real income growth is projected to start to recover gradually in 2018, although to remain modest. That reflects imported inflation falling back and a pickup in pay growth (Section 4), which outweighs the effects of slower employment growth.

Table 2.A Net trade supported GDP growth in Q2
Expenditure components of demand^(a)

Percentage changes on a quarter earlier	Averages					2017 Q1	2017 Q2
	1998–2007	2008–09	2010–12	2013–15	2016		
Household consumption ^(b)	0.9	-0.5	0.1	0.6	0.6	0.3	0.2
Private sector investment	0.5	-4.6	2.0	0.9	0.6	1.6	-0.6
<i>of which, business investment^(c)</i>	0.5	-3.4	2.2	0.4	0.5	0.8	0.5
<i>of which, private sector housing investment</i>	0.6	-7.0	1.5	2.3	1.0	3.6	-2.9
Private sector final domestic demand	0.8	-1.1	0.5	0.9	0.5	0.6	0.1
Government consumption and investment ^(c)	0.9	0.9	-0.2	0.3	0.5	-0.4	0.9
Final domestic demand	0.8	-0.7	0.3	0.8	0.5	0.4	0.3
Change in inventories ^{(d)(e)}	0.0	0.0	0.1	0.0	-0.1	0.1	-0.1
Alignment adjustment ^(e)	0.0	-0.1	0.0	0.0	-0.1	-0.1	-0.2
Domestic demand^(f)	0.8	-0.8	0.4	0.8	0.2	0.7	-0.1
'Economic' exports ^(g)	1.1	-1.0	0.8	0.9	0.9	-0.3	1.7
'Economic' imports ^(g)	1.4	-1.2	0.8	1.3	0.7	1.0	0.2
Net trade^{(e)(g)}	-0.1	0.1	0.0	-0.1	0.0	-0.4	0.4
Real GDP at market prices	0.7	-0.7	0.4	0.7	0.4	0.3	0.3
Memo: nominal GDP at market prices	1.2	-0.2	0.9	0.9	1.2	0.8	0.7

(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.

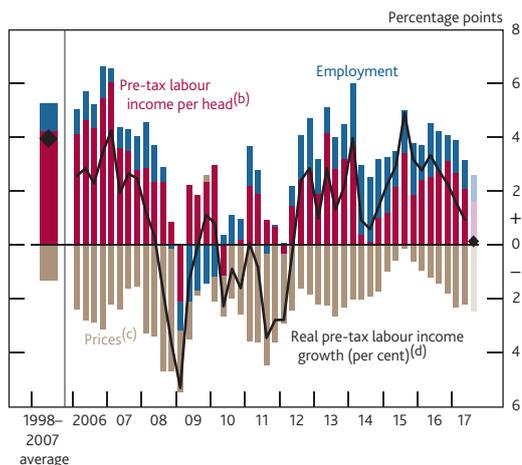
(e) Percentage point contributions to quarterly growth of real GDP.

(f) Includes acquisitions less disposals of valuables.

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

Chart 2.2 Household real labour income growth has slowed

Contributions to four-quarter real pre-tax labour income growth^(a)



(a) Diamond and light bars show Bank staff projections for 2017 Q3.

(b) Wages and salaries plus mixed income, divided by employment.

(c) Measured using the consumption deflator (including non-profit institutions serving households).

(d) Nominal pre-tax labour income divided by the consumption deflator (including non-profit institutions serving households).

Following recent data revisions, consumption growth is estimated to have slowed only gradually over the year to 2017 Q2, less sharply than household real income growth. As a result, the saving ratio — the proportion of overall income that households save — declined (**Chart 2.3**). The overall level of the saving ratio in recent years has, however, been revised up reflecting an improved, and higher, measure of dividend income. The box on pages 12–13 describes these revisions in more detail. Moreover, although the current saving ratio is still somewhat below its past average level, some parts of household income such as those going directly to pension schemes are likely to be less relevant for current spending decisions.⁽¹⁾ A measure of saving out of available income, which excludes those elements, has also fallen over the past year but is around its historical average level (**Chart 2.3**).

The pace at which households continue to moderate their spending growth in response to the current squeeze in real income growth will depend on a number of factors. One of those is how confident households are about their future income growth. Aggregate consumer confidence (**Chart 1.2**) and, within that, households' expectations of their personal financial situation have fallen over the past two years, but only to slightly below their long-run averages.

Retail interest rates can also affect household spending. In recent years, interest rates on mortgages, consumer credit and deposits have all fallen to historically low levels (**Chart 2.4**). In aggregate, that will have supported household spending growth, in part by lowering the cost of consuming now relative to in the future and by reducing debt-servicing costs for borrowers. In addition to the fall in interest rates, broader lending conditions in the consumer credit market have eased and growth in consumer credit has been rapid in recent years. As explained in the box on pages 16–17, the impact of rapid consumer credit growth in recent years on spending growth is likely to have been relatively modest and there are some signs that overall consumer credit conditions are starting to tighten slightly.

Following the recent rise in market interest rates (Section 1), household interest rates are expected to pick up gradually, though to remain at low levels. The box on pages 18–21 explores the likely impact on households' interest payments, using results on the distribution of household balance sheets from the recent Bank/NMG survey.

Quarterly consumption growth is expected to have picked up slightly from 0.2% in Q2 to 0.3% in Q3. Some of the weakness in spending in Q2 looks to have been erratic, with car purchases declining sharply. That decline is broadly

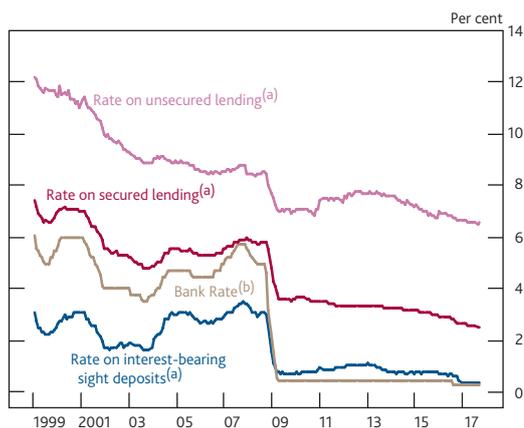
(1) For more details, see the box on pages 16–17 of the May 2017 Report; www.bankofengland.co.uk/publications/Pages/inflationreport/2017/may.aspx.

Chart 2.3 The saving ratio has been revised up
Household saving



- (a) Saving as a percentage of household post-tax income. Includes non-profit institutions serving households.
 (b) Saving as a percentage of household post-tax income, excluding income not directly received by households such as flows into employment-related pension schemes and imputed rents. Excludes non-profit institutions serving households. For further details see <https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/articles/alternativemeasuresofrealhouseholddisposableincomeandthesavingratio/apriltajune2017>.

Chart 2.4 Interest rates on borrowing remain low
Bank Rate and selected household effective interest rates



- (a) Effective rates on the stock of sterling household loans and deposits. The Bank's effective rate series are currently compiled using data from up to 19 UK monetary financial institutions (MFIs) and are average monthly rates. Not seasonally adjusted.
 (b) Monthly average of daily data.

Chart 2.5 New car registrations have recovered somewhat



Sources: Society of Motor Manufacturers and Traders and Bank calculations.

- (a) Seasonally adjusted by Bank staff.

consistent with the sharp fall in private new car registrations in April (**Chart 2.5**), some of which may reflect an increase in Vehicle Excise Duty on high-polluting vehicles. Since then, car registrations have bounced back somewhat. Retail sales volumes rose in Q3 and, together with survey indicators, point to modest consumption growth. Housing market activity — which tends to correlate fairly well with consumption growth — picked up slightly (Section 2.2).

As at the time of the *August Report*, consumption growth is projected to remain subdued in the near term (**Table 2.B**), reflecting continued slow real income growth and the ongoing adjustment to the past squeeze in real income growth. Further ahead, consumption growth is projected to rise gradually as the drag from sterling's depreciation on real income growth diminishes and wage growth picks up (Section 5).

2.2 Housing market

As well as contributing directly to GDP through housing investment, activity in the housing market can provide a signal about household spending. This is in part because decisions about whether to buy a house and how much to consume tend to be driven by common factors such as interest rates, income growth and confidence. Rises in house prices can also affect spending by raising the value of homeowners' equity, which they can then use as collateral against which to borrow, although this effect is estimated to be small.⁽¹⁾

As discussed in the box on pages 17–18 of the *August Report*, the housing market slowed in 2017 H1, consistent with the squeeze in household income growth and subdued consumption growth. Since then, housing transactions, mortgage approvals and house price inflation have been slightly stronger than expected (**Chart 2.6**). That may in part reflect further falls in mortgage interest rates in Q3 (Section 1).

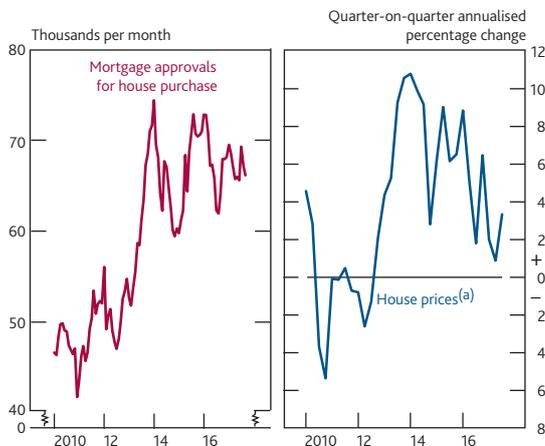
The outlook for the housing market remains fairly subdued, with the balance of respondents to the September RICS housing survey reporting lower price and sales expectations for the coming months than earlier in the year. In the near term, price inflation and activity in the housing market are projected to remain well below past averages, broadly consistent with the outlook for income and consumption.

While housing investment was weak in Q2 (**Table 2.A**), the stabilisation in housing activity should provide some support to measured housing investment in the near term. That is because around a fifth of such investment is made up of services associated with property transactions, such as estate agents' and solicitors' fees.

(1) For more details, see the box on pages 18–19 of the *November 2016 Report*; www.bankofengland.co.uk/publications/Pages/inflationreport/2016/nov.aspx.

Chart 2.6 House price inflation has stabilised having slowed earlier in 2017

Mortgage approvals for house purchase and house prices



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

(a) Average of the quarterly Halifax/Markit and Nationwide house price indices.

The other four fifths of investment comprises spending on new dwellings and improvements to existing dwellings. New housing starts have picked up by 20% since the start of 2016, although they fell back slightly in Q2. Housing investment growth overall is projected to be fairly subdued in coming quarters (Table 2.B).

2.3 Government spending

Public sector net borrowing was estimated to have been £32.5 billion between April and September 2017, the smallest figure at this point in the fiscal year since 2007. In addition, estimates of borrowing in the fiscal year 2016/17 have been revised down significantly since the initial estimate, in part reflecting an upward revision to income tax and VAT receipts.

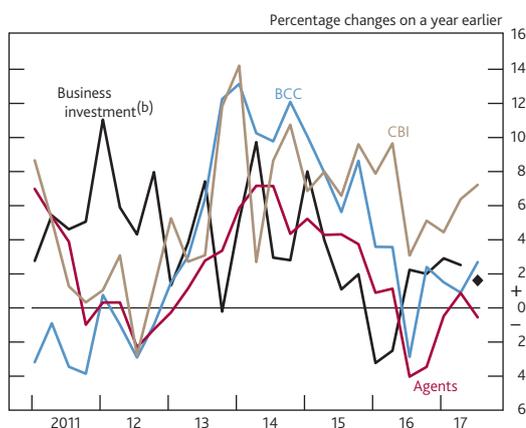
The MPC's forecasts are conditioned on the Government's tax and spending plans detailed in the Spring 2017 *Budget*. Under these plans, the fiscal consolidation continues, weighing on overall GDP growth over the MPC's forecast period.

2.4 Business investment

Following recent upward revisions, business investment is estimated to have grown by 2½% in the year to 2017 Q2 (Chart 2.7), slightly above its past average rate. Nevertheless, past falls mean that the level of investment remains low relative to the size of the capital stock. That will continue to weigh on growth in the capital stock and thus on productivity and potential supply growth (Section 3).

Chart 2.7 Business investment growth has picked up since early 2016

Business investment and survey indicators of investment intentions^(a)



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

(a) Survey measures are scaled to match the mean and variance of four-quarter business investment growth since 2000. CBI measure is the net percentage balance of respondents reporting that they have increased planned investment in plant and machinery for the next twelve months. BCC measure is the net percentage balance of respondents reporting that they have increased planned investment in plant and machinery; data are not seasonally adjusted. Agents measure shows companies' intended changes in investment over the next twelve months; last available observation for each quarter. Sectors are weighted together using shares in real business investment.

(b) Chained-volume measure. Data are adjusted for the transfer of nuclear reactors from the public corporation sector to central government in 2005 Q2. The diamond shows Bank staff's projection for 2017 Q3.

Survey evidence suggests that the continuing strength of global demand (Section 1) and high profit margins on export sales following sterling's depreciation are likely to be supporting investment in export capacity. In addition, the rate of return on capital, as measured by the ONS, remains high and spare capacity appears to be fairly limited (Section 3).

Set against that, the depreciation of sterling will also have raised the cost of investment because, with the main exception of buildings, investment is relatively import-intensive. In addition, a number of surveys suggest that the anticipation of Brexit and related uncertainties are weighing on investment. For instance, in a recent survey on investment intentions by the Bank's Agents, economic uncertainty, expected changes to future UK trading arrangements and other Brexit factors were the most commonly cited factors weighing on investment plans.

While retained earnings are the most important source of finance for capital spending, borrowing conditions can also affect investment. The cost of corporate bond issuance (Section 1) and of bank borrowing have fallen and credit availability for many businesses has improved in recent years.

Revisions to the National Accounts and the Balance of Payments

The *Blue Book* is an annual ONS publication in which National Accounts data are revised to incorporate both a wider range of information and methodological improvements. The 2017 *Blue Book* was published in October along with the 2017 *Pink Book*, which contained revisions to the Balance of Payments.⁽¹⁾ Revisions to overall GDP and expenditure data were fairly small and are described elsewhere in Sections 2 and 3. Revisions to the allocation of income and wealth between sectors of the economy were, however, more material. This box describes those changes in more detail.

Revisions to the sectoral allocation of income

There were two key revisions to the allocation of income. The first was a reallocation of income from the corporate to the household sector.⁽²⁾ As discussed in the box on pages 16–17 of the *May Report*, the ONS has switched to using HMRC tax data to estimate dividend income. Those data suggest that household dividend income has risen sharply over the past two decades, from around 1.7% of pre-tax household income in 1997 to 4.5% in 2016, as an increasing number of the self-employed have chosen to incorporate their businesses and to take part of their income in the form of dividends.⁽³⁾

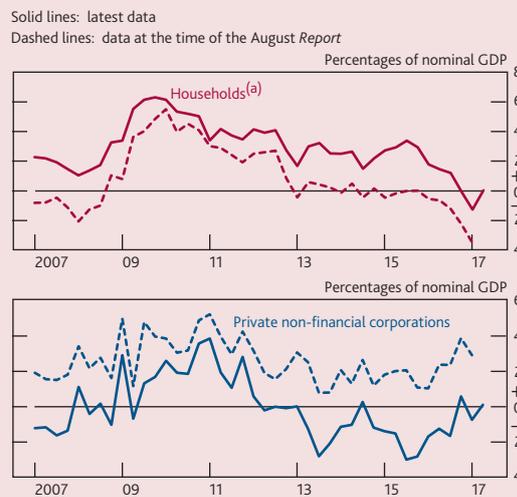
That upward revision to dividend income has led to the household saving ratio also being revised up (Section 2). As a result, the household financial balance — which captures the difference between household saving and investment — is now estimated to have been positive rather than negative over much of the recent past (**Chart A**). The counterpart to the rise in household dividend income has been a fall in the income of companies who have paid out those dividends. That revision has pushed down on the corporate financial balance, which is now estimated to have been negative over most of the past five years.

The second key revision primarily affects the allocation of income between the corporate sector and the rest of the world. As discussed in the *May Report*, the ONS has revised up the amount of interest that is estimated to have been paid on UK corporate bonds. That has further reduced corporate sector income and thus the corporate financial balance (**Chart A**), since companies are now estimated to have been paying more interest on their debt.

A significant proportion of those higher interest payments are estimated to have been paid abroad. As a result, the current account deficit, as a proportion of GDP, has been revised around 1 percentage point wider on average since 2006 (**Chart B**). The current account deficit is estimated to have widened to 4.6% of GDP in 2017 Q2, from 4.4% in Q1,

Chart A Households are now estimated to have been net savers over much of the recent past while companies have been net borrowers

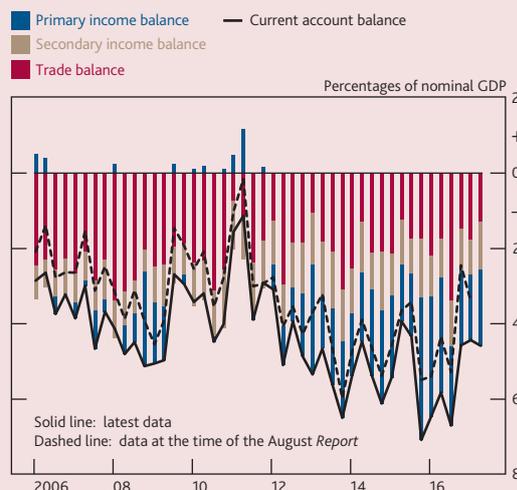
Household and private non-financial corporation financial balances



(a) Includes non-profit institutions serving households.

Chart B The current account deficit has been revised wider

UK current account



compared with 3.4% in the Q1 data available at the time of the *August Report*. Those revisions reflect a more negative balance on primary income — the net value of investment income received by UK residents. In contrast, the trade balance was broadly unrevised.

- (1) For articles outlining the revisions in more detail, see <https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/articles/nationalaccounts/articles/previousReleases>.
- (2) Throughout, the household sector refers to households and non-profit institutions serving households (NPISH). As part of the changes incorporated in the 2017 *Blue Book*, however, estimates for households and NPISH are now presented separately as well as jointly in the National Accounts.
- (3) The upward revision to dividend income is partly offset by a reduction in mixed income — the income of the self-employed — in recent years, as sole traders that incorporated moved from the household to the corporate sector.

Revisions to the sectoral allocation of wealth

The *Blue Book* and *Pink Book* also contained revisions to the allocation of wealth between sectors of the economy. While estimates of household debt are broadly unchanged from previously published data, the stock of household financial assets has been revised down by £96 billion in 2016, or 2% of household net financial wealth. Most of that downward revision reflects lower estimated entitlements from defined contribution pension schemes as a result of a switch to using data from The Pensions Regulator. Those lower pension entitlements have correspondingly raised the net wealth of the corporate sector.

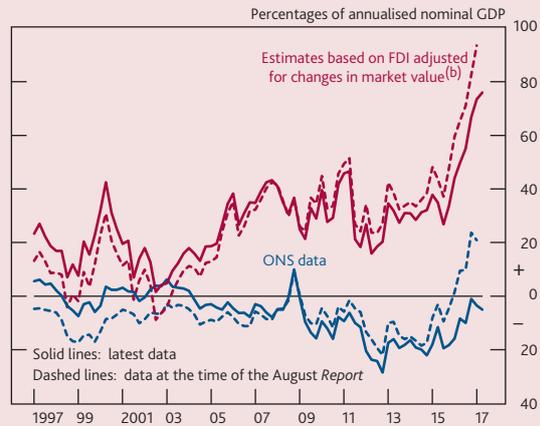
The changes incorporated in the *Pink Book* also have implications for the net international investment position (NIIP) — the stock of UK foreign assets less the liabilities owed to other countries. Since those assets, net of liabilities, can be used to finance the current account deficit, the level of the NIIP may affect investors' perceptions of how sustainable a given current account deficit is likely to be.

The official measure of the NIIP in 2016 has been revised down by 20% of GDP (**Chart C**). That downward revision primarily reflects updated benchmarking of share ownership using the 2012 and 2014 Share Ownership Surveys, which suggest that the value of UK equities held overseas is higher than previously thought. The counterpart to that higher wealth held overseas is a smaller amount of wealth held by financial corporations in the United Kingdom.

Overall, the NIIP is now estimated to be slightly negative as a share of annual GDP. The values of foreign direct investment (FDI) assets and liabilities within that are, however, difficult to measure accurately.⁽¹⁾ Official estimates use the book or purchase value of these assets. Another approach is to try to adjust for changes in the market value using movements in equity prices. One such measure suggests that, despite the downward revision, the NIIP remains significantly positive, at around 75% of GDP (**Chart C**).

Chart C The UK net international investment position has been revised down

Estimates of the UK net international investment position^(a)



Sources: Bloomberg, ONS and Bank calculations.

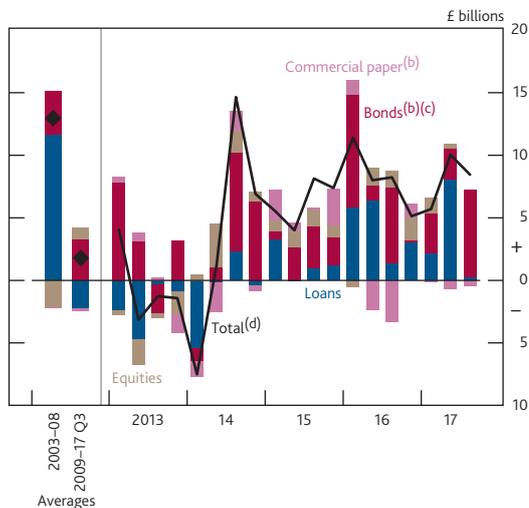
(a) Data are not seasonally adjusted.

(b) For details on how FDI estimates are adjusted for changes in market value see footnote (3) on page 23 of the *May 2014 Report*; www.bankofengland.co.uk/publications/Documents/inflationreport/2014/ir14may.pdf.

(1) FDI refers to investment in business interests in another country, such as ownership of or a controlling interest in a foreign company.

Chart 2.8 Net external finance raised by UK companies remained robust in Q3

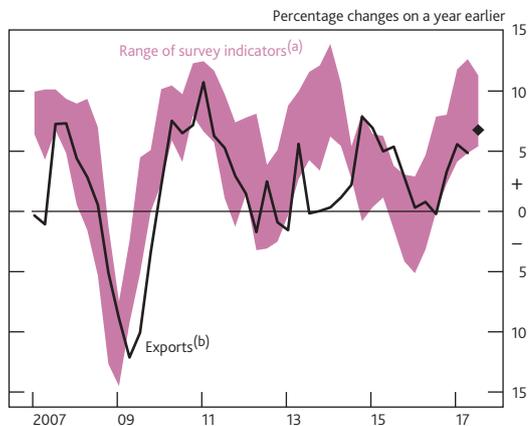
Net external finance raised by UK private non-financial corporations^(a)



- (a) Includes sterling and foreign currency funds from UK MFIs and capital markets.
 (b) Not 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.

Chart 2.9 Surveys continue to point to robust export growth

UK exports and survey indicators of export growth



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

- (a) Swathe includes: BCC net percentage balance of companies reporting that export orders and deliveries increased on the quarter or were expected to increase over the following quarter (data are not seasonally adjusted); CBI average of the net percentage balances of manufacturing companies reporting that export orders and deliveries increased on the quarter, and that their present export order books are above normal (the latter series is a quarterly average of monthly data); Markit/CIPS net percentage balance of manufacturing companies reporting that export orders increased this month compared with the previous month (quarterly average of monthly data); Agents measure of manufacturing companies' reported annual growth in production for sales to overseas customers over the past three months (last available observation for each quarter); EEF average of the net percentage balances of manufacturing companies reporting that export orders increased over the past three months and were expected to increase over the next three months. Indicators are scaled to match the mean and variance of four-quarter export growth since 2000.
 (b) Chained-volume measure, excluding the impact of MTIC fraud. The diamond shows Bank staff's projection for 2017 Q3.

In the latest *Credit Conditions Survey*, however, lenders reported that the cost of corporate credit rose in Q3 and was expected to rise slightly further in Q4. The box on pages 18–21 explores the likely impact of a rise in interest rates on companies' financing conditions.

Total net finance raised by companies remained robust in Q3, driven by a pickup in bond issuance (Chart 2.8). Having risen sharply in Q2, bank lending fell back; but that volatility largely reflected the effects of a few large mergers and acquisitions during the summer.

Investment growth is expected to have slowed slightly in 2017 Q3, before picking back up to rates broadly consistent with surveys of investment intentions on average (Chart 2.7). That is a similar outlook to that in August (Table 2.B), but weaker than would have been expected given global and financial conditions alone (Section 5).

2.5 Exports

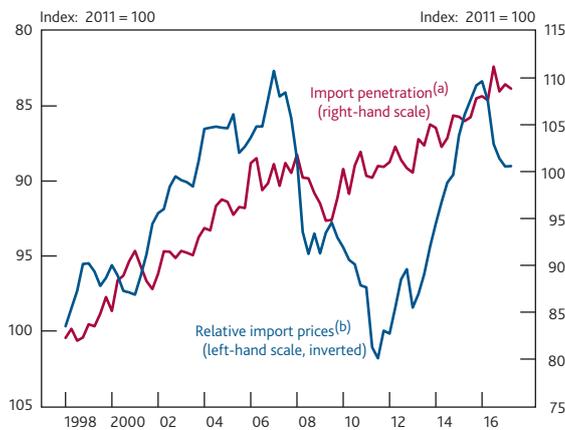
The strength in global demand, along with the depreciation in sterling (Section 1), is likely to be supporting growth in export volumes. Between 2015 Q4 and 2017 Q2, export prices fell by 5% in foreign currency terms, suggesting some improvement in competitiveness. But they rose by 12% in sterling terms, meaning that the profit margins on exports are also likely to have increased. That rise in margins is likely to support an expansion in export volumes among firms with spare capacity. As that capacity is eroded, and for firms with limited spare capacity, those higher margins should also provide an incentive to invest (Section 2.4), thus boosting export volumes further over time. The outlook for exports and related investment will, however, also depend on how both domestic and foreign companies anticipate and respond to changes in the United Kingdom's trading arrangements.

In the latest data, growth in export volumes over the year to Q2 was robust, at 5% (Chart 2.9). Growth in exports of goods — just over half of the total — was particularly strong. Capital and intermediate goods accounted for much of that strength, consistent with the strength in global capital goods orders (Section 1).

Four-quarter growth in aggregate exports is expected to have risen further in Q3, broadly in line with survey indicators (Chart 2.9). Further ahead, export growth is projected to slow somewhat but will continue to be supported by the strength in global growth and the recent rise in exporters' margins (Section 5).

Chart 2.10 Import penetration has continued to increase despite higher import prices

Imports relative to import-weighted demand and relative import prices



- (a) UK imports as a proportion of import-weighted total final expenditure, chained-volume measures. Import-weighted total final expenditure is calculated by weighting together household consumption (including non-profit institutions serving households), whole-economy investment (excluding valuables), government spending, changes in inventories (excluding the alignment adjustment) and exports by their respective import intensities, estimated using the *United Kingdom Input-Output Analytical Tables 2013*. Import and export data have been adjusted to exclude the estimated impact of MTIC fraud.
- (b) Import price deflator divided by the market price GDP deflator.

2.6 Imports and net trade

Growth in imports will depend on growth in overall final demand as well as its composition, as some components are more import-intensive than others. In addition, sterling's depreciation is likely to encourage some substitution away from imports towards domestically produced goods and services, which have become relatively cheaper.

Import growth was solid over the year to Q2. That was mainly accounted for by strong growth in goods imports, which in part appears to reflect buoyant final demand for UK exports that tend to be embedded in global supply chains (Section 2.5). Relative to overall final demand, however, import volumes have increased over the past year (Chart 2.10). That may in part be because relative import prices remain lower than over most of the past decade, even after the recent pickup. In addition, following a rise in import prices, it typically takes some time for producers of domestic substitutes to increase output due to capacity constraints and the need to shift resources, and for companies reliant on imports to adjust existing supply chains. Partly as a result of those constraints starting to diminish, import growth is projected to slow in coming quarters.

Following recent revisions, net trade is estimated to have contributed positively to GDP growth in recent quarters (Chart 2.1). In Q3, net trade is expected to have subtracted from GDP growth, mainly reflecting a change in the direction of trade in non-monetary gold from a net export in Q2 to a net import in Q3. That is a volatile component of UK trade, reflecting activity in the London gold bullion market, and has no impact on aggregate demand; movements in non-monetary gold are offset by movements in private sector investment in valuables. This component, and therefore overall net trade, is likely to bounce back in Q4. Net trade is projected to continue to provide further support in coming quarters (Table 2.B), as import growth slows by more than export growth (Section 5).

Table 2.B Monitoring the MPC's key judgements

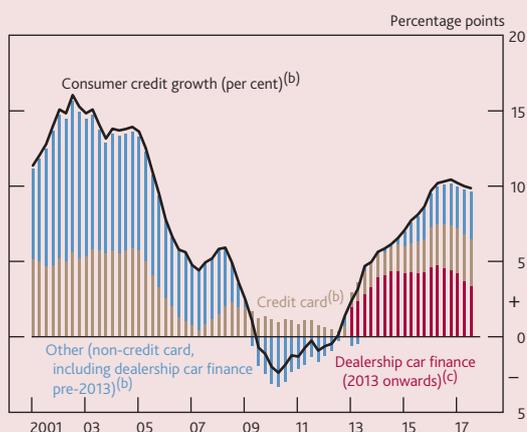
Developments anticipated in August during 2017 Q3–2018 Q1	Developments now anticipated during 2017 Q4–2018 Q2
Cost of credit	Broadly unchanged
• Credit spreads to be broadly flat.	• Credit spreads to be broadly flat.
Consumer spending	Broadly unchanged
• Real post-tax household income to be broadly flat.	• Real post-tax household income to increase slightly in 2018 H1.
• Quarterly consumption growth to average ¼%.	• Quarterly consumption growth to average ¼%.
Housing market	Revised up slightly
• Mortgage approvals for house purchase to average around 66,000 per month.	• Mortgage approvals for house purchase to average around 68,000 per month.
• The average of the Halifax/Markit and Nationwide house price indices to increase by a little less than ½% per quarter, on average.	• The average of the Halifax/Markit and Nationwide house price indices to increase by just under ¾% per quarter, on average.
• Quarterly housing investment growth to average 1%.	• After picking up in Q3, quarterly housing investment growth to average just over ¼%.
Business investment	Broadly unchanged
• Quarterly growth in business investment to average ½%.	• Quarterly growth in business investment to average ¾%.
Trade	Broadly unchanged
• Net trade to provide a small boost to quarterly GDP growth.	• Net trade to provide a small boost to quarterly GDP growth.

Developments in consumer credit

Consumer credit includes household borrowing through credit cards, dealership car finance and other unsecured debt such as personal loans. Although only 11% of the stock of household debt, strong consumer credit growth (**Chart A**) has accounted for around a third of the overall increase in net lending to households since 2012. This box explores the possible drivers of this growth and the characteristics of the households who have taken out consumer credit recently. It then examines the ways in which such credit can influence household spending, before discussing the outlook for consumer credit.

Chart A Consumer credit has grown rapidly in recent years

Contributions to four-quarter consumer credit growth^(a)



(a) See www.bankofengland.co.uk/statistics/Pages/iadb/notesiadb/Changes_flows_growth_rates.aspx for a description of how growth rates are calculated using credit data.

(b) Sterling net lending by UK monetary financial institutions (MFIs) and other lenders to UK individuals (excludes student loans). Not seasonally adjusted.

(c) Identified dealership car finance lending by UK MFIs and other lenders. Not seasonally adjusted.

Drivers of the growth in consumer credit in recent years

Robust household demand is likely to have supported consumer credit growth over 2014–16. Consumer confidence and, within that, households' expectations of their personal financial situation were above their past average rates over much of this period (Section 2). This, together with steady falls in unemployment (Section 3), will have encouraged households to make major purchases and, for some, to take out consumer credit to help smooth out the costs of financing those purchases.

In addition, there has been a material easing in consumer credit supply conditions in recent years, reflecting intense competition and falls in bank funding costs (Section 1). For example, the quoted interest rate on a £10,000 personal loan has fallen by around 4 percentage points since 2012, reaching a record low in 2017 H1 (**Table 1**). Other terms and conditions have also eased, with a marked lengthening in interest-free periods on credit card balance transfers.

Table 1 Consumer credit conditions have eased materially over the past few years

Average interest rates and other terms on consumer credit lending

	Monthly averages							
	2005–08	2009–12	2013–15	2016	2017			
					Q1	Q2	Q3	Oct.
Interest rates (per cent)^(a)								
£10,000 unsecured loan	7.8	9.0	5.3	4.1	3.7	3.8	3.8	3.7
£5,000 unsecured loan	10.0	12.7	9.7	9.2	9.3	7.8	8.1	8.2

Other terms on credit card lending

Average 0% balance transfer term (months) ^(b)	8.2	12.4	19.6	25.7	29.6	28.8	28.1	n.a.
Average balance transfer fee (per cent) ^(b)	2.3	2.9	2.9	2.6	2.4	2.3	2.2	n.a.

Sources: Moneyfacts Group and Bank calculations.

(a) Sterling-only end-month quoted rates. The Bank's quoted interest rate series are currently compiled using data from up to 19 UK MFIs. Data are not seasonally adjusted. October data are flash estimates of the provisional estimates, which will be published on 7 November.

(b) The average 0% balance transfer term is the average of each lender's maximum 0% balance transfer term available. The average balance transfer fee is the average of the fees applied to these products. Longer transfer terms and lower fees imply easier credit conditions. Whole market data, excluding values of zero. End-month data.

Furthermore, there has been a structural shift in the way car purchases are financed, with around 90% of new cars bought with dealership car finance in 2016, compared with around 50% in 2009. Such finance typically involves personal contract purchases (PCP), a type of agreement with fixed monthly payments that are lower than other forms of car finance. That is because at the end of the loan customers either make an additional payment for a pre-agreed amount to purchase the car or return the vehicle to the dealer. This structural shift will have boosted consumer credit growth, partly because the entire amount of PCP loans are recorded as credit, even though not all customers will make that final payment to purchase the car.

Dealership car finance has accounted for around half of the overall increase in consumer credit since 2013 (**Chart A**), and will have boosted overall consumer credit growth. As much of that shift in the way car purchases are financed has now occurred, the strong contribution from dealership car finance to consumer credit growth has started to fall and is likely to ease somewhat further in coming years.⁽¹⁾

Around half of the growth in the stock of consumer credit over 2015 and 2016 is estimated to have been concentrated in borrowers who did not previously have such debt. According to Bank/NMG surveys carried out in 2017, households who had recently taken out consumer credit were more likely to have high incomes. Around 40% of households with consumer credit also held savings in excess of the balance on their consumer debt. And around half of households who also had a mortgage reported that, on balance, it was cheaper or easier to obtain a personal loan than to increase their mortgage borrowing.

(1) For more details on the different forms of consumer credit, see the box on pages 18–19 of the June 2017 *Financial Stability Report*; www.bankofengland.co.uk/publications/Pages/fsr/2017/jun.aspx.

According to the latest NMG survey, the proportion of households reporting that unsecured debt is a burden picked up in 2017 but remains below recent highs (**Chart B**). Perhaps consistent with that, lenders responding to the Q3 *Credit Conditions Survey* reported that default rates had increased a little, although the performance of consumer credit lending remained generally strong.

Chart B The share of households who found unsecured debt a heavy burden picked up in 2017

Proportion of households reporting that unsecured debt repayments are a heavy burden^(a)



Sources: British Household Panel Survey (BHPS), NMG Consulting survey and Bank calculations.

(a) Question: 'To what extent is the repayment of these loans and the interest a financial burden on your household?'. Calculated using British Household Panel Survey (1995 to 2004), face-to-face NMG Consulting survey (2005 to 2011) and online NMG Consulting survey (2012 onwards). Data from the BHPS and face-to-face NMG surveys have been spliced to be consistent with online NMG results.

Links between consumer credit growth and consumption

Developments in household spending growth are likely to be reflected in demand for consumer credit. But in addition, changes in consumer credit driven by an increase in credit supply can boost spending directly. One crude way of gauging the size of such effects is simply to compare increases in the net flow of new consumer credit with increases in consumption. On that basis, since 2012 the increase in the flow of consumer credit accounted for only 8% of the increase in consumption.

The actual impact of consumer credit growth on spending, however, could well be smaller or larger than that simple approach. On the one hand, not all consumer credit necessarily generates additional spending as some households who take out credit to spend may have savings they would otherwise have used. On the other hand, any increase in spending due to increases in credit growth is likely to support demand and so overall household income. That can then lead to further increases in spending over and above the initial boost. Overall, it appears unlikely that the increase in the net flow of consumer credit has been a material driver of the increase in consumption in recent years.

Recent developments and the outlook

Four-quarter growth in consumer credit has eased slightly over 2017, to 9.9% in Q3 (**Chart A**). That appears largely to reflect softer demand for credit, with consumption growth slowing in recent quarters (Section 2.1). In particular, growth in car finance has eased, consistent with the weakness in new car purchases, although part of that easing is also likely to reflect the end of the structural shift in the way car purchases are financed.

There are also signs that consumer credit supply conditions may have started to tighten slightly. The average interest-free period on credit card balance transfers has shortened a little (**Table 1**). And in the latest *Credit Conditions Survey*, lenders reported that unsecured credit availability had fallen in Q3 and was expected to fall further in Q4. Nevertheless, competition in the consumer credit market remains intense. Consumer credit growth is projected to remain robust, although to moderate further in coming years (Section 5), in part as the structural shift towards greater use of dealership finance in car purchases continues to run its course.

Developments in consumer credit are relevant to financial stability. As discussed in the June 2017 *Financial Stability Report*, falling interest margins on lending do not appear to have been accompanied by a corresponding improvement in the underlying credit quality of new lending. The Prudential Regulation Authority's (PRA's) review of consumer credit lending, published in July, found that the resilience of lenders' portfolios had been falling.⁽¹⁾ In the Record of its September meeting, the Financial Policy Committee (FPC) set out that it judges that there is a pocket of risk in the rapid growth of consumer credit.⁽²⁾ While not a material risk to economic growth through its effect on household spending, it is a risk to banks' ability to withstand severe economic downturns and therefore potentially to financial stability. The FPC has responded to this risk by accelerating its analysis of credit losses that banks could incur in the very deep recession encapsulated in the 2017 annual stress-test scenario. Although the overall credit quality of consumer credit has improved significantly since the financial crisis, the FPC judges that lenders overall are placing too much weight on the recent performance of loans in benign conditions as an indicator of underlying credit quality. As a result, they have been underestimating the losses they could incur in a downturn. This is just one element of the overall stress test, results for which will be published on 28 November and used to set regulatory capital buffers.

(1) For more details, see the PRA statement on consumer credit; www.bankofengland.co.uk/pradocuments/publications/reports/prastatement0717.pdf.

(2) For more details, see the FPC September Record; www.bankofengland.co.uk/publications/Pages/Records/fpc/2017/record1710.aspx.

The sensitivity of households and companies to changes in interest rates

During the financial crisis, the MPC reduced Bank Rate to 0.5% and conducted a programme of asset purchases to support spending. As a result, interest rates for households and companies fell significantly. In August 2016, as the economy showed early signs of an abrupt hit to activity and confidence following the EU referendum, the MPC voted to introduce a package of measures to support the economy. That included a further cut in Bank Rate to 0.25%.⁽¹⁾ These measures were calibrated to balance the trade-off that emerged immediately after the referendum between ensuring a sustainable return of inflation to the target and supporting jobs and activity. Since then, funding costs of banks have also declined significantly relative to reference rates (Section 1), and so many household and corporate interest rates have fallen further to historically low levels (Chart 1.14 and Chart 2.4).

More recently, market interest rates have risen slightly reflecting expectations that the MPC will raise Bank Rate (Section 1). While that market-implied path for Bank Rate implies only a very gradual rise in coming years, it does imply some unwinding of the most recent falls in interest rates for households and companies.

Changes in the current and expected level of Bank Rate influence spending through a number of channels. They can affect the exchange rate, and therefore external demand. They influence domestic demand via changes in domestic asset prices and levels of wealth.

A more direct channel operates via retail interest rates. By raising the real cost of borrowing and the return on saving, rises in interest rates reduce the incentive to spend today relative to in the future. They also raise payments on existing debt and deposits. Spending by net borrowers tends to be more sensitive to these changes in cash flow than net savers, reducing spending in aggregate.

This box examines the impact of changes in Bank Rate on those cash flows, across households and firms. It draws on a range of evidence including the latest Bank/NMG survey of household finances.⁽²⁾

Households

Pass-through to effective interest rates facing households

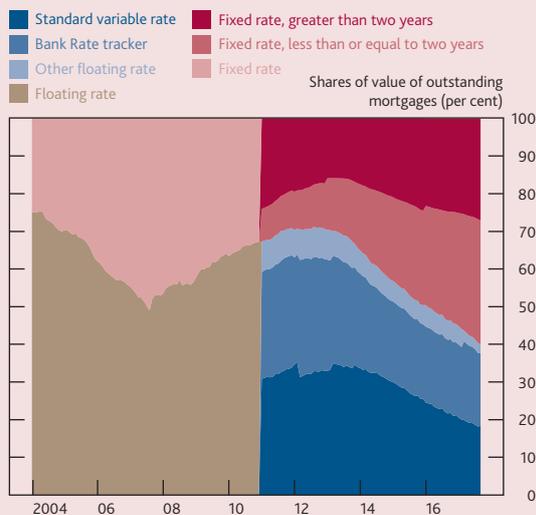
By raising the cost at which banks can obtain funding, increases in Bank Rate and market interest rates will increase the interest rates on new borrowing and deposits for households. How quickly that feeds through to the interest rates on existing saving and borrowing will depend on the

proportion of those balances that are 'floating rate' — linked to Bank Rate or market interest rates. For savers and borrowers with 'fixed-rate' products, the interest rates on those products will only change when the fixed-rate period comes to an end.

Around a third of households have a mortgage on their home. In aggregate, mortgage debt represents around three quarters of the overall stock of household debt. The share of fixed-rate mortgages by value has risen significantly in recent years to around 60% of the stock of mortgages (Chart A). So while a change in Bank Rate would feed through to some mortgages quite quickly, the overall effect would be relatively gradual. Even as interest rates start to rise, past falls (Chart 2.4) may mean that some mortgagors will continue to move onto lower interest rates than they had previously, when their fixed rates expire. For example, someone moving from an expiring five-year fixed rate to a new one could see rates fall by around 200 basis points, and for two-year fixed rates the fall could be around 30 basis points.

Chart A A growing share of mortgages by value are fixed-rate contracts

Distribution of mortgage lending^{(a)(b)}



(a) Average daily balances on sterling household loans reported on form ER (effective rates). Data are not seasonally adjusted. Data from January 2016 are comprised of individuals and individual trusts only. For more information, see the article 'Developments in effective rates statistics' in the December 2015 edition of *Bankstats*; www.bankofengland.co.uk/statistics/Documents/articles/2016/10jan.pdf.

(b) More granular breakdowns are included from the earliest point at which the data were collected.

(1) For more details on the MPC's August 2016 policy package see the box on pages iii–viii of the August 2016 Report; www.bankofengland.co.uk/publications/Documents/inflationreport/2016/aug.pdf.

(2) A forthcoming *Quarterly Bulletin* article will contain more analysis of the results of the 2017 H2 survey, which was conducted online from 6 to 26 September and had 6,018 respondents.

Other components of household borrowing — such as consumer credit and student loans — are less directly sensitive to Bank Rate. The interest rates on these products tend to be either fixed rate (Table 1) or driven predominantly by factors other than Bank Rate (for consumer credit, see the box on pages 16–17). In particular, the size of monthly repayments on student loans are determined entirely by borrower income and are unrelated to the loan interest rate or principal outstanding. On loans extended since 2012–13, borrowers repay 9% of income above £21,000 and nothing if earnings are below this threshold.

By comparison, only around one quarter of household deposits are fixed rate (Table 1). So a rise in Bank Rate may feed through to effective saving rates more quickly than to borrowing rates on average.

Table 1 Proportion of the stock of UK-resident bank and building society loans and deposits at fixed rate^(a)

Per cent	2008 Q1	2017 Q3
Secured lending to households	45	59
Consumer credit lending to households	68	80
Lending to private non-financial corporations ^(b)	n.a.	12
Deposits from households ^{(c)(d)}	17	26
Deposits from private non-financial corporations ^{(c)(d)}	46	44

- (a) Average UK MFI daily balances on sterling household loans and deposits reported on form ER (effective rates), and balance sheet data reported on forms BE and BT. Not seasonally adjusted.
 (b) Data prior to 2016 are not available on a consistent basis. Does not account for companies hedging their floating-rate exposures.
 (c) Floating-rate comprises sight deposits and redeemable-at-notice time deposits.
 (d) Fixed-rate comprises non interest bearing deposits and fixed-maturity time deposits.

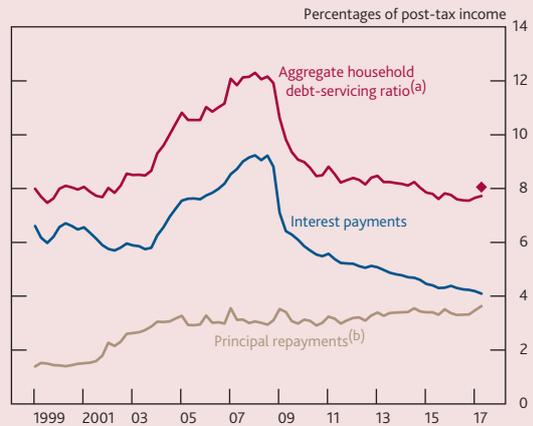
Sensitivity of household income to changes in interest rates

As a rise in interest rates is passed through, the sizes of household debt and deposits will determine the direct 'cash-flow' impact on households' income and spending. In aggregate, total debt-servicing costs relative to income — interest payments plus repayments of principal — have fallen fairly steadily in recent years (Chart B). That has been more than accounted for by a decline in interest payments, which are at a historically low level relative to income. Principal repayments have risen relative to income.

Among the third of households who have a mortgage on their home, the average outstanding balance in June 2017 was around £125,000 with an average repayment term of 16 years remaining. Once passed on in full, a 25 basis point rise in Bank Rate would lead to an increase in the servicing cost of that average mortgage of around £15 a month. Just over a fifth of those who have a mortgage, around two million households, are likely to have never experienced a rise in Bank Rate since they became a mortgagor. Almost half of those are estimated to have taken out a mortgage since July 2014, when the FPC's Recommendation on affordability

Chart B The aggregate household debt-servicing ratio remains relatively low

Aggregate household debt-servicing ratio and its components



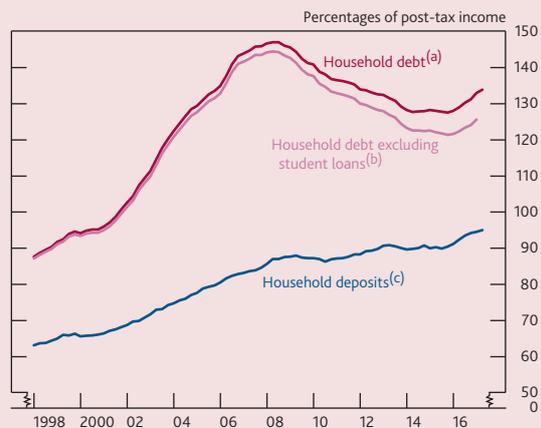
- (a) Household debt-servicing ratio calculated as interest payments plus mortgage principal repayments as a proportion of nominal household post-tax income. Household income has been adjusted to take into account the effects of Financial Intermediation Services Indirectly Measured. Diamond shows the debt-servicing ratio if interest rates rise by 25 basis points and pass-through to loan rates is full and immediate, and income is unchanged.
 (b) Excludes repayments associated with endowment policies. Not seasonally adjusted.

tests was implemented. As a result, those households will have been tested when taking out the mortgage to ensure they can still afford their mortgages were Bank Rate to rise by 300 basis points.

The majority of households do not have mortgages. And, in aggregate, the stock of household debt has fallen since prior to the crisis, relative to household income (Chart C). Student loans, in particular, have accounted for an increasing share of aggregate debt in recent years. Excluding student loans, the fall in debt over the past decade as a proportion of income is

Chart C Aggregate household debt has fallen relative to deposits over the past decade

Aggregate household deposit and debt to income ratios



- (a) Household financial liabilities as a percentage of the four-quarter moving sum of nominal household post-tax income. Financial liabilities exclude unfunded pension liabilities and financial derivatives of the non-profit sector, and are not seasonally adjusted. Household income has been adjusted to take into account the effects of Financial Intermediation Services Indirectly Measured.
 (b) Measure in footnote (a) less student loans. Latest observation is 2017 Q1.
 (c) Deposits with UK MFIs, as a percentage of the four-quarter moving sum of nominal household post-tax income. Deposits data are not seasonally adjusted. Household income has been adjusted to take into account the effects of Financial Intermediation Services Indirectly Measured.

even more marked. Student loans are likely to continue to push up household debt in coming years; excluding them, debt is projected to grow broadly in line with income.

In addition to the fall in aggregate debt relative to income, deposits have risen faster than income over the past decade. As a result, the direct impact of an increase in Bank Rate on household cash flow in aggregate may be more modest now than in the recent past. For example, based on the current stock of debt and deposits and assuming full and immediate pass-through to both, including non-mortgage debt, a 25 basis point rise in interest rates would increase monthly net interest payments by £4 per household, on average, equivalent to a reduction of 0.1% of post-tax income. Because a greater share of mortgages are fixed rate than deposits, though, this would be somewhat smaller at first, and take some time to come through.

The impact on spending of a rise in interest rates via this cash-flow channel will depend on how households respond. Evidence from the NMG survey in recent years suggests that the spending of net borrowers is more sensitive than that of net savers to changes in their cash flow. For example, the results suggest that in response to an extra £20 of interest payments, borrowers would reduce spending by around £10 on average. In contrast, in response to an increase of £20 in their interest income, savers on average would increase spending by only £2. The latest findings from the 2017 H2 NMG survey suggest the sizes of those responses are likely to be similar or slightly smaller than in the past.

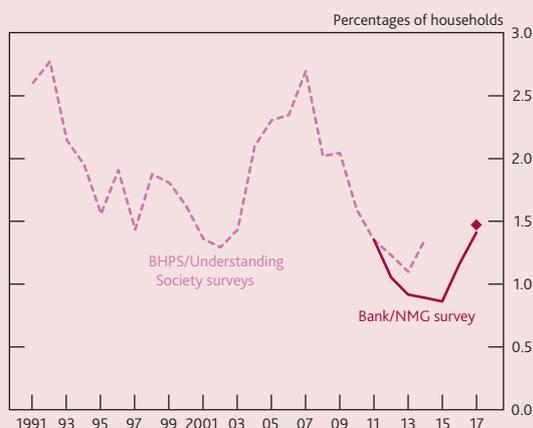
Even within these broad categories there are likely to be significant variations in the response to a change in interest rates. Mortgagors with relatively high debt-servicing ratios may need to cut back spending by more if interest rates rise. As explained on page 4 of the June 2017 *Financial Stability Report*, high mortgage debt-servicing ratios are typically associated with a sharp increase in the incidence of repayment difficulties. The NMG survey suggests that, having fallen during the financial crisis, the share of households with a mortgage debt-servicing ratio above 40% of pre-tax income has risen since 2015 (**Chart D**). That share remains around pre-crisis lows, however, and a 25 basis point rise in interest rates — even if passed through fully and immediately to all mortgage rates — would increase the share only slightly (the diamond in **Chart D**). It would probably take a further rise of around 1½ percentage points before this proportion returned to its pre-crisis average of 2%, even assuming no rise in nominal incomes.

Companies

The sensitivity of business investment to increases in interest rates will depend on how the overall cost of finance facing

Chart D The proportion of households with a high debt-servicing ratio is relatively low

Proportion of households with a mortgage debt-servicing ratio above 40% of pre-tax income^(a)



Sources: British Household Panel Survey (BHPS), NMG Consulting survey, Understanding Society (US) and Bank calculations.

(a) Mortgage debt-servicing ratio calculated as total mortgage payments as a percentage of pre-tax income. Percentage of households with mortgage debt-servicing ratio above 40% is calculated using BHPS (1991 to 2008), US (2009 to 2014), and NMG Consulting survey (2011 to 2017). A new household income question was introduced in the NMG survey in 2015. Data from 2011 to 2014 surveys have been spliced on to 2015 data to produce a consistent time series. The diamond shows estimated share of households with debt-servicing ratio greater than 40% if interest rates rise by 25 basis points and pass-through to loan rates is full and immediate, and income is unchanged.

companies is affected, and how reliant businesses are on borrowing to fund investment.

Pass-through to companies' financing costs

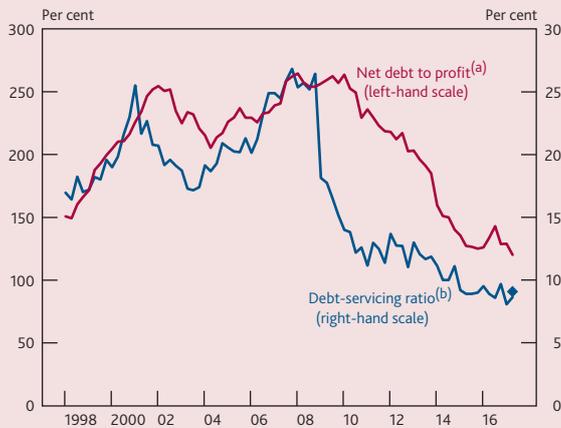
The vast majority of corporate bank debt has a floating interest rate (**Table 1**). While some companies will purchase financial instruments to hedge their floating-rate exposures and so reduce their sensitivity to changes in interest rates, market intelligence suggests that has become less common in recent years. Any rise in Bank Rate is therefore likely to pass through fairly quickly to the cost of bank borrowing for companies.

In aggregate, however, UK private non-financial corporations (PNFCs) have reduced their reliance on bank debt since 2009. This is partly due to a significant deleveraging in the commercial real estate sector, which in 2009 accounted for over 40% of aggregate corporate debt. Intelligence from the Bank's Agents suggests that it also reflects a broader shift in the way businesses finance investment. Companies now use a greater proportion of financing from internal funds and, for large companies, bond and equity issuance (**Chart 2.8**).

In addition, company deposits have continued to grow steadily. As a result, the size of companies' overall debt net of deposits has fallen materially relative to their profits in recent years (**Chart E**). That will have reduced the negative impact of any rise in interest rates on the profitability of the corporate sector.

Chart E Companies' net debt relative to profit and the proportion of profit spent servicing debt have fallen in recent years

PNFCs' net debt to profit and debt-servicing ratios



- (a) PNFCs' net debt (gross bank debt and non-bank debt less deposits) as a percentage of the four-quarter moving sum of gross operating surplus excluding the alignment adjustment and the effects of Financial Intermediation Services Indirectly Measured. Net debt is not seasonally adjusted.
- (b) PNFCs' interest payments as a percentage of gross operating surplus excluding the alignment adjustment and the effects of Financial Intermediation Services Indirectly Measured. Diamond shows the debt-servicing ratio if interest rates rise by 25 basis points and pass-through to loan rates is full and immediate, and profit is unchanged.

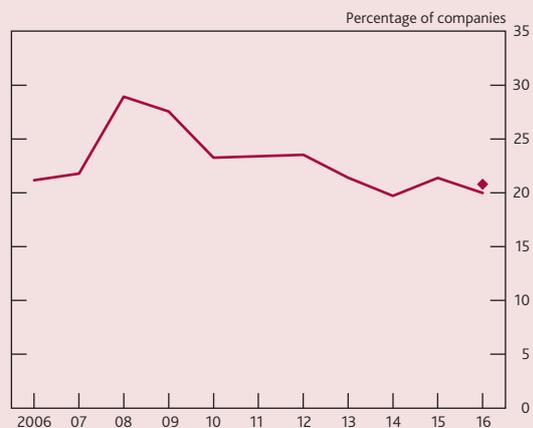
Sensitivity of companies' profits to changes in interest rates

Mainly as a result of falls in bank debt and falls in interest rates, the aggregate debt-servicing ratio — the share of profits required to meet monthly debt repayments — has also fallen to very low levels in recent years (Chart E). As shown by the diamond in Chart E, a 25 basis point rise passed through fully and immediately to all borrowing rates would increase this metric by around 0.5 percentage points, leaving it still well below its level in recent decades.

Despite the likelihood of a more benign impact on aggregate profitability than in the past, spending by less profitable companies may be more sensitive to changes in interest costs. According to 2016/17 financial accounts data, the proportion of companies whose profit does not currently cover their interest payments was smaller than in preceding years, and slightly below its level in 2006 (Chart F). As shown by the diamond in Chart F, a 25 basis point rise in effective interest rates, even if passed through fully and immediately to all loan rates, would increase this metric only slightly.

Chart F The proportion of companies with profit less than interest payments has fallen in recent years

Proportion of companies with profit less than their interest payments^(a)



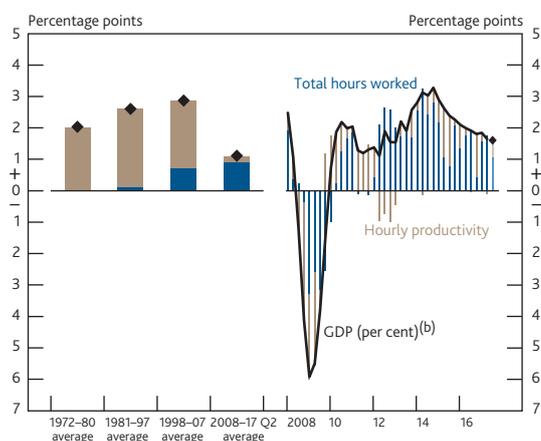
Sources: Company House data (via Bureau van Dijk) and Bank calculations.

- (a) Profit is based on earnings before interest and tax. 2016 data based on partial sample. Diamond shows the proportion if interest rates rise by 25 basis points, pass-through to loan rates is full and immediate, and profit is unchanged. Year of data point refers to the start of the financial year, eg 2016 is for financial year 2016/17.

3 Output and supply

Output growth has been modest in recent quarters. In contrast, growth in employment has remained fairly robust and the unemployment rate has fallen by more than expected. Accordingly, productivity growth has been weak and is expected to remain subdued. The modest outlook for growth in supply capacity will limit the pace at which output can grow without generating inflationary pressure.

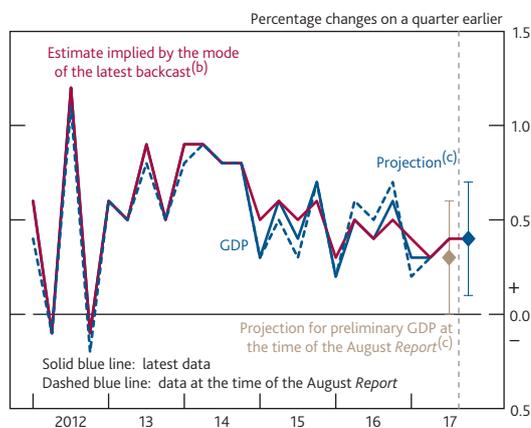
Chart 3.1 Output growth has been driven mainly by growth in hours worked rather than productivity
Decomposition of four-quarter GDP growth^(a)



Sources: ONS and Bank calculations.

- (a) Diamond and light bars on the right-hand panel chart are Bank staff's projections for 2017 Q3, based on the backcast for the final estimate of GDP and labour market data to August.
(b) Chained-volume measure, based on the backcast for the final estimate of GDP. Percentage change on a year earlier.

Chart 3.2 GDP growth remained modest in Q3
Output growth and Bank staff's near-term projection^(a)



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 final estimate of the data. The observation for 2017 Q4, to the right of the vertical line, is consistent with the MPC's central projection.
(c) The blue diamond shows Bank staff's projection for preliminary GDP growth in 2017 Q4. The bands on either side of the diamonds show uncertainty around the projections based on one root mean squared error of past Bank staff forecasts for quarterly GDP growth made since 2004.

The outlook for output growth depends on the evolution of demand (Section 2) and the economy's potential supply capacity. Faster growth in demand relative to potential supply will erode the degree of slack in the economy and, all else equal, eventually result in domestic inflationary pressure (Section 4), as existing capital and labour are used more intensively.

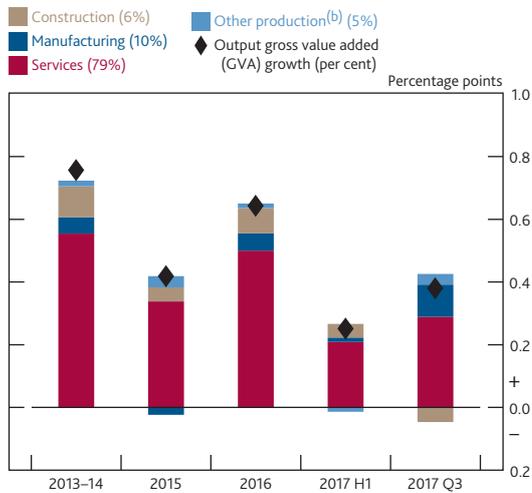
Since the end of the financial crisis, output growth has, unusually, been driven largely by increases in hours worked, with little growth in productivity (Chart 3.1). Although output growth has been subdued in recent quarters (Section 3.1), the increase in the total number of hours worked — in particular, growth in the number of people in work — has largely held up (Section 3.2). As a result, slack in the economy appears to have narrowed further and probably only a little remains. The unemployment rate — an indicator of labour market slack — fell to 4.3% in the three months to August, a little below the MPC's estimate of the equilibrium rate made in February 2017.⁽¹⁾

As slack in the economy has been absorbed, the outlook for output growth has become increasingly dependent on how quickly productivity can rise. The trend rate of productivity growth appears to have fallen in recent years, meaning that overall potential supply has grown more slowly than in the past (Section 3.3). And the effect of Brexit-related uncertainties, including the subdued outlook for business investment (Section 2), is likely to weigh further on productivity growth in coming years. As a result of that diminished rate of supply growth, the pace at which demand can expand before it leads to domestic inflationary pressure is likely to be modest (Section 5).

(1) For more details, see the box on pages 18–20 of the February 2017 Report; www.bankofengland.co.uk/publications/Documents/inflationreport/2017/feb.pdf.

Chart 3.3 The slowing in output growth has been mainly due to the service sector

Contributions to average quarterly GVA growth^(a)

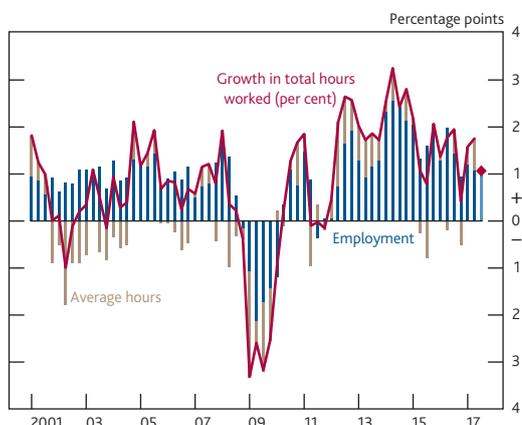


Sources: ONS and Bank calculations.

- (a) Chained-volume measures at basic prices. Figures in parentheses are weights in nominal GDP in 2015. Components may not sum to the total due to chain-linking. Note that growth in GVA can differ from growth in GDP, shown in Chart 3.2. The difference between the two results from the basic price adjustment, statistical discrepancy and alignment adjustment.
 (b) Other production includes utilities, extraction and agriculture.

Chart 3.4 Growth in total hours worked has been driven by robust employment growth

Contributions to four-quarter growth in total hours worked^(a)



Sources: Labour Force Survey and Bank calculations.

- (a) Diamond and light bars are Bank staff's projections for 2017 Q3, based on data to August.

Table 3.A Employment growth was robust in 2017 H1
Changes in employment^(a)

	Quarterly averages								
	2000 -07	2008 -09	2010 -12	2013 -14	2015	2016	2017 Q1	2017 Q2	2017 Q3
Change in employment (thousands)	70	-59	67	130	147	75	121	126	16
of which, employees	55	-67	32	106	110	40	136	134	n.a.
of which, self-employed and other ^(b)	16	7	35	24	36	35	-15	-8	n.a.

- (a) Changes relative to the previous quarter. Figure for 2017 Q3 is Bank staff's projection, based on data to August.
 (b) Other comprises unpaid family workers and those on government-supported training and employment programmes classified as being in employment.

3.1 Output

Having slowed somewhat in recent quarters, output growth remained modest at 0.4% in Q3 according to the preliminary estimate of GDP (Chart 3.2). That was 0.1 percentage points higher than projected three months ago.

The profile of GDP growth in recent years has been revised in the latest data. While on average the revisions have been fairly small, they point to a more gradual slowing in four-quarter growth since 2015 than previously estimated. Recent estimates are likely to be revised further once the ONS receives and incorporates a fuller range of data. The MPC's backcast, which takes into account information from business surveys and the past revision properties of the official data, points to an even more gradual slowing in growth.

The majority of the slowdown in output growth since the end of 2016 has been accounted for by slower growth within the service sector (Chart 3.3). Part of that may reflect sluggish growth in household consumption, as higher import prices following sterling's depreciation have weighed on households' purchasing power (Section 2).

Having stalled in 2017 H1, manufacturing output growth picked up sharply in Q3 (Chart 3.3). The weakness in the first half of the year was partly due to erratic factors. A sharp fall in output in the pharmaceuticals sector in Q1 unwound unusual strength in 2016 Q4. And a large fall in manufacturing of transport equipment in Q2 mostly unwound in Q3. In contrast to the official data, survey indicators of activity have pointed to an above-average expansion in manufacturing output over the course of 2017, consistent with the support to exporters from sterling's depreciation and the strength in global demand (Section 2).

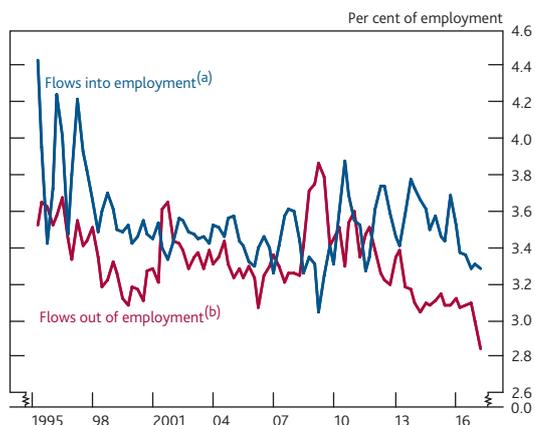
Overall output growth is projected to remain modest at 0.4% in Q4 (Chart 3.2), although there are risks around this projection. Survey indicators of expected activity growth point to a range of outturns for GDP growth in Q4. The CBI measure points to stronger growth, while the IHS Markit/CIPS measure fell in Q3 and points to weaker growth.

3.2 Labour market developments

In contrast to the slowdown in output growth in recent quarters, growth in total hours worked has largely held up (Chart 3.4). That was mainly accounted for by growth in the number of people in work, although growth is likely to have slowed somewhat in Q3 (Table 3.A). Average hours worked per person are expected to have been broadly unchanged in the year to Q3.

Chart 3.5 The rate at which workers are leaving employment has fallen

Flows into and out of employment



Sources: Labour Force Survey and Bank calculations.

- (a) Number of people who reported having moved to employment from either unemployment or inactivity in the past three months. Excludes job-to-job moves. Seasonally adjusted by Bank staff. Two-quarter moving average.
- (b) Number of people who reported having moved from employment to either unemployment or inactivity in the past three months. Excludes job-to-job moves. Seasonally adjusted by Bank staff. Two-quarter moving average.

Table 3.B Growth in labour demand remains robust

Vacancies, redundancies and survey indicators of employment intentions and recruitment difficulties

	Quarterly averages						2017		
	2002–2008–07	2008–09	2010–12	2013–14	2015	2016	Q1	Q2	Q3
Surveys of employment intentions^(a)									
Agents ^(b)	0.7	-1.7	0.3	0.9	1.0	0.1	0.2	0.3	0.3
BCC ^(c)	19	-3	8	26	25	21	23	22	22
CBI ^(d)	3	-20	-3	17	18	16	15	14	18
REC ^(e)	58	44	56	63	64	59	63	63	64
Vacancies to labour force ratio^(f)									
	2.07	1.70	1.48	1.85	2.24	2.25	2.30	2.32	2.33
Redundancies to employees ratio^(g)									
	0.52	0.68	0.51	0.39	0.35	0.36	0.30	0.35	0.33
Surveys of recruitment difficulties^(a)									
Agents ^(b)	1.1	-2.5	-1.1	0.4	2.0	1.3	1.4	1.8	2.0
BCC ^(c)	60	55	51	57	66	62	61	66	68
CBI, skilled ^(h)	27	15	16	23	34	32	32	30	29
CBI, other ^(h)	8	2	2	3	8	8	6	8	13

Sources: Bank of England, BCC, CBI, CBI/PwC, KPMG/REC/IHS Markit, Labour Force Survey (LFS), ONS and Bank calculations.

- (a) Measures for the Bank's Agents (manufacturing and services), the BCC (non-services and services) and CBI (manufacturing, financial services, business/consumer/professional services and, for employment intentions, distributive trades) are weighted together using employee job shares from Workforce Jobs. The REC data cover the whole economy.
- (b) The scores are on a scale of -5 to +5, with positive scores indicating stronger employment intentions over the next six months, and greater recruitment difficulties in the most recent three months relative to normal. Last available observation for each quarter.
- (c) Net percentage balance of companies expecting their workforce to increase over the next three months, or percentage of respondents reporting recruitment difficulties over the past three months. Data are not seasonally adjusted.
- (d) Net percentage balance of companies expecting their workforce to increase over the next three months.
- (e) Quarterly average. Recruitment agencies' reports on the demand for staff placements compared with the previous month. A reading above 50 indicates growth on the previous month and below 50 indicates a decrease.
- (f) Vacancies as a percentage of the workforce, calculated using rolling three-month measures. Excludes vacancies in agriculture, forestry and fishing. Figure for 2017 Q3 shows vacancies in the three months to September relative to the size of the labour force in the three months to August.
- (g) Redundancies as a percentage of total LFS employees, calculated using rolling three-month measures. Figure for 2017 Q3 is for the three months to August.
- (h) Net percentage balance 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).

The recent growth in aggregate employment appears to have been driven mainly by a reduction in the rate at which people are leaving their jobs, while the rate at which people enter employment, although volatile, has remained broadly stable (Chart 3.5). The flows from employment to unemployment have been at record lows in recent quarters, probably reflecting strength in companies' labour demand growth and a desire to hold on to existing workers, especially in light of subdued wage pressures (Section 4). Relatedly, the rate of redundancies has remained low (Table 3.B). In addition, the squeeze on real income (Section 2) may have encouraged some individuals who would otherwise have left the labour force to stay in employment.

Indicators suggest that companies' labour demand growth is likely to remain relatively robust in the near term. Most survey measures of employment intentions are above their historical averages (Table 3.B). And the number of vacancies relative to the size of the labour force — one indicator of hiring intentions — has picked up in recent quarters and remained elevated in Q3.

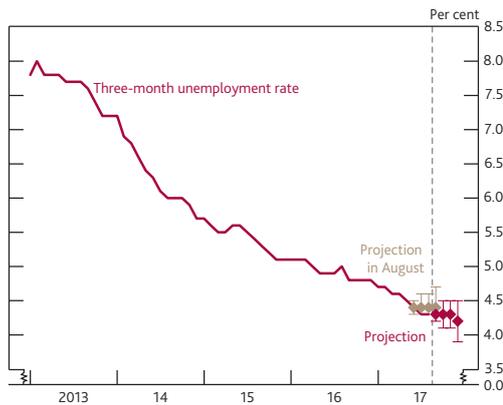
One consequence of the robust growth in employment has been a tightening in the labour market. Most survey measures of recruitment difficulties have increased (Table 3.B). And the unemployment rate fell to 4.3% in the three months to August (Chart 3.6). That was lower than expected at the time of the August Report, and a little below the MPC's estimate of the equilibrium unemployment rate made in February 2017. As set out in the February Report, however, there remains significant uncertainty around that estimate and there is a range of views among MPC members.

The past tightening in the labour market is likely to lead to greater upward pressure on wage growth (Section 4). The outlook for labour market tightness will depend not only on companies' demand for labour but also on developments in labour supply.

One important determinant of labour supply is the proportion of the population participating in the labour market, either by working or by looking for employment. The participation rate has risen in recent years and was slightly higher than anticipated in 2017 Q2, although it is expected to have fallen back somewhat in Q3 (Chart 3.7).

The participation rate is expected to remain broadly flat in coming years, reflecting two offsetting factors. The rising average age of the population is likely to weigh on aggregate labour force participation because the participation rate of older people tends to be lower. But participation rates among older people have increased steadily in recent years and this trend is expected to continue. In addition, as discussed above, it is possible that the squeeze in real income following sterling's depreciation (Section 2) may encourage some

Chart 3.6 The unemployment rate has fallen further
Unemployment rate and Bank staff's near-term projection^(a)



(a) The beige diamonds show Bank staff's central projections for the headline unemployment rate for the three months to June, July, August and September 2017, at the time of the *August Report*. The red diamonds show the current staff projections for the headline unemployment rate for the three months to September, October, November and December 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 headline unemployment rate.

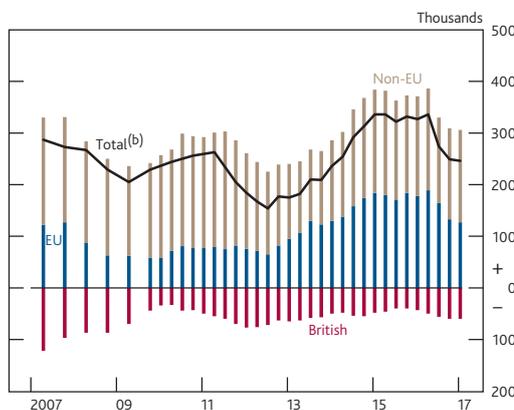
Chart 3.7 The participation rate is expected to have fallen back in Q3
Labour force participation rate^(a)



Sources: Labour Force Survey and Bank calculations.

(a) Percentage of 16+ population. The diamond shows Bank staff's projection for 2017 Q3, based on data to August.

Chart 3.8 Net inward migration has fallen
Net inward migration by nationality^(a)



Sources: ONS and Bank calculations.

(a) Rolling four-quarter flows. Data are half-yearly to December 2009 and quarterly thereafter, unless otherwise stated. Figures by nationality do not sum to the total prior to 2012.
(b) Data are half-yearly to December 2011 and quarterly thereafter.

individuals to enter the labour market in order to supplement their household income, or to remain in work for longer than they otherwise would have.

Growth in labour supply will also be determined by population growth. In the MPC's latest forecasts, population growth is assumed to evolve in line with the ONS's projection published in October 2015. In the ONS's most recent projection, published on 26 October 2017, the population grows a little more slowly in coming years than previously projected.

A key influence on population growth is net migration to the United Kingdom. Net migration levels fell from 327,000 in the year to 2016 Q1 to 246,000 in the year to 2017 Q1, due mainly to a fall in net migration from the European Union (**Chart 3.8**). The ONS projects net migration to fall somewhat further in coming years, although that path is very uncertain and will depend on a number of factors including the United Kingdom's relative economic performance, the sterling exchange rate and government policy.

Although changes in net migration affect labour supply, they also affect domestic demand. As a result, past shifts in net migration do not appear to have had a significant direct impact on slack or aggregate wage growth.⁽¹⁾ But intelligence from the Bank's Agents suggests that, were migration to fall abruptly, that could have more significant short-term consequences for supply — and hence for inflationary pressure — in some sectors that have become reliant on migrant labour.

Overall, labour market indicators point to some rebound in employment growth in Q4, following weakness in Q3, and a further slight fall in unemployment (**Chart 3.6**). Beyond that, labour demand and supply growth are projected to be modest, and unemployment to be broadly flat (Section 5).

3.3 Productivity

Given the tightening in the labour market and projected modest labour supply growth, the outlook for overall supply growth will increasingly depend on growth in productivity. Hourly productivity fell by 0.1% in the year to Q2 (**Chart 3.9**), as output growth slowed while growth in hours worked held up (Section 3.2). That was weaker than expected in August, in part due to a downward revision to four-quarter GDP growth in the latest data (Section 3.1). Productivity growth is expected to pick up very gradually in the near term as any remaining spare capacity within firms is absorbed, but to remain weak relative to its past average.

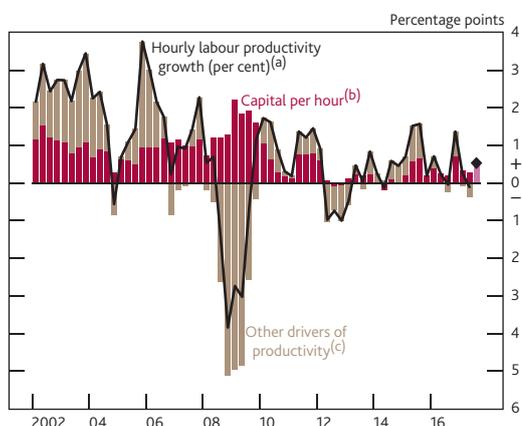
(1) For more details, see the box on pages 30–31 of the *May 2015 Report*; www.bankofengland.co.uk/publications/Documents/inflationreport/2015/may.pdf.

Table 3.C Monitoring the MPC's key judgements

Developments anticipated in August during 2017 Q3–2018 Q1	Developments now anticipated during 2017 Q4–2018 Q2
Unemployment	Revised down slightly
• Unemployment rate to remain around its current rate of 4½%.	• Unemployment rate to remain around its current level of 4¼%.
Participation	Broadly unchanged
• Participation rate to remain around its current level of 63½%.	• Participation rate to remain around its current level of 63½%.
Average hours	Broadly unchanged
• Average weekly hours worked to fall to around 32.	• Average weekly hours worked to be broadly flat at just over 32.
Productivity	Broadly unchanged
• Quarterly hourly labour productivity growth to average just under ½%.	• Quarterly hourly labour productivity growth to average just under ½% in 2018 H1.

Chart 3.9 Productivity growth has been weak

Contributions to four-quarter whole-economy hourly labour productivity growth

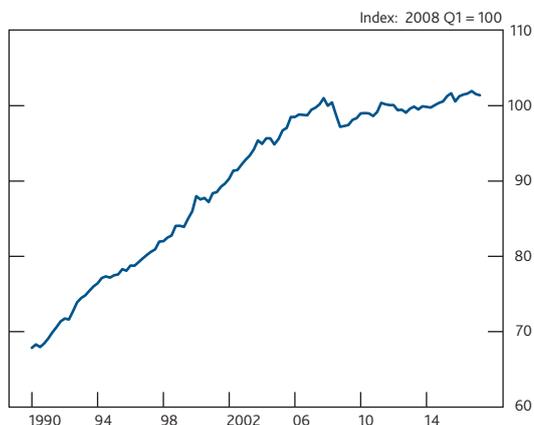


Sources: ONS and Bank calculations.

- (a) Output per hour is based on the backcast for the final estimate of GDP. Percentage change on a year earlier. The diamond shows Bank staff's projection for 2017 Q3.
 (b) Fixed capital stock, including structure, machinery, vehicles, computers, purchased software, own-account software, mineral exploration, artistic originals and R&D. Calculations are based on Oulton, N and Wallis, G (2015), 'Integrated estimates of capital stocks and services for the United Kingdom: 1950–2013', *Centre for Economic Performance Discussion Paper No. 1342*. Final observation shows Bank staff's projection for 2017 Q3.
 (c) Calculated as a residual.

Chart 3.10 Productivity has barely risen over the past decade

Whole-economy hourly labour productivity^(a)



Sources: ONS and Bank calculations.

- (a) Output per hour is based on the backcast for the final estimate of GDP.

Some of the recent weakness in productivity growth may have been caused by a shift in the composition of employment growth. Employment growth in the year to 2017 Q2 was more concentrated in occupations and industries associated with lower wages than usual (Section 4). To the extent that these characteristics are also associated with lower levels of productivity, this shift in workforce composition will have dragged on aggregate productivity growth as well as pay growth. But these compositional effects will only bear down on productivity growth for as long as such shifts continue.

More broadly, productivity growth has been so weak since the onset of the financial crisis that the level of productivity is barely above its pre-crisis peak a decade ago (Chart 3.10). Part of that weakness in recent years has been caused by slow growth in the capital stock — the resources and equipment available to produce output — relative to hours worked (Chart 3.9). That is the result of weak business investment (Section 2). In addition, the efficiency with which labour and capital are put to use — known as total factor productivity (TFP) — is estimated to have fallen sharply during the financial crisis and remained subdued since then. That weakness in TFP growth has been a global phenomenon, perhaps in part reflecting low diffusion of technology between the most productive firms and the rest.⁽¹⁾ The persistent weakness of productivity growth has meant that the MPC's forecasts for productivity have been revised down repeatedly in recent years.

In addition to the factors that have weighed on it since the crisis, productivity growth is likely to be further constrained by firms' anticipation of and response to post-Brexit trading arrangements. Uncertainty around the outlook for these arrangements is likely to weigh on investment in the capital stock (Section 2). Any reduction and reorientation of trade and supply chains is also likely to weigh on TFP growth, for example as some companies in the United Kingdom shift from supplying customers in the European Union to those in the rest of the world, and may result in some existing supply capacity becoming obsolete.⁽²⁾

Taken together, these factors are consistent with productivity growth remaining subdued in coming years. Alongside modest labour supply growth, that will weigh on growth in the United Kingdom's overall potential supply capacity, which in turn will limit the speed at which output can grow before it leads to domestic inflationary pressure (Section 5).

- (1) For more details, see Haldane, A (2017), 'Productivity puzzles'; www.bankofengland.co.uk/publications/Pages/speeches/2017/968.aspx and Andrews, D, Criscuolo, C and Gal, P (2016), 'The global productivity slowdown, technology divergence and public policy: a firm-level perspective', OECD.
 (2) For more details, see Carney, M (2017), '[De]Globalisation and inflation'; www.bankofengland.co.uk/publications/Pages/speeches/2017/996.aspx and the box on page 29 of the *August 2016 Report*; www.bankofengland.co.uk/publications/Documents/inflationreport/2016/sep.pdf.

4 Costs and prices

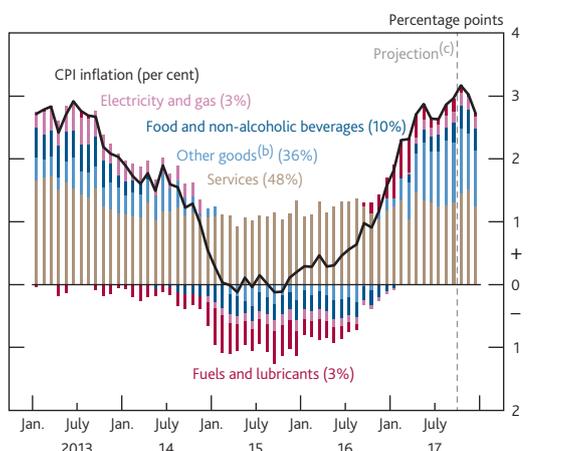
CPI inflation rose to 3.0% in September. It is expected to peak at 3.2% in October, as increases in imported costs — stemming from the past fall in sterling and a more recent pickup in global energy prices — are passed on to consumer prices. Inflation is then expected to fall back as past rises in energy prices drop out of the annual comparison and as the pass-through of rises in other import prices progresses. Alongside that moderation in external pressures, however, domestic inflationary pressures are likely to build to more normal levels.

Chart 4.1 CPI inflation has increased to 3%
CPI inflation and Bank staff's near-term projection^(a)



(a) The beige diamonds show Bank staff's central projection for CPI inflation in July, August and September 2017 at the time of the August *Inflation Report*. The red diamonds show the current staff projection for October, November and December 2017. The bands on each side of the 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 Food, energy and other goods have driven much of the pickup in inflation over the past year
Contributions to CPI inflation^(a)



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

(a) Contributions to annual CPI inflation. Figures in parentheses are CPI basket weights in 2017.
(b) Difference between CPI inflation and the other contributions identified in the chart.
(c) Bank staff projection. Fuels and lubricants estimates use Department for Business, Energy and Industrial Strategy petrol price data for October 2017 and are then based on the November 2017 *Inflation Report* sterling oil futures curve, shown in Chart 4.4.

4.1 Consumer price developments and the near-term outlook

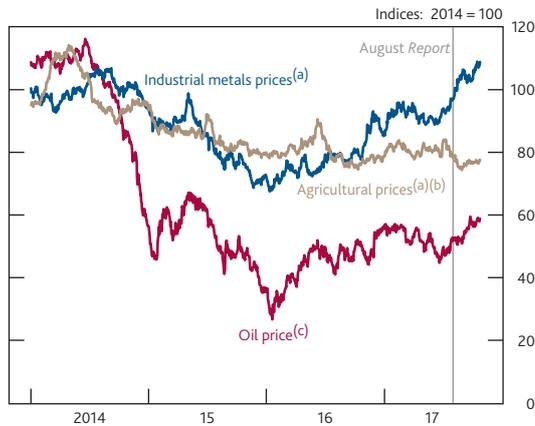
CPI inflation increased to 3.0% in September from 2.6% in June, slightly above the 2.8% projected at the time of the August *Report* (Chart 4.1). That upside news reflected larger-than-expected contributions from clothing and footwear prices and retail fuel.

The increase in inflation to above the MPC's 2% target over the past year reflects the effects of the continued rise in import prices following sterling's depreciation (Section 4.2). Over this period, inflation has picked up most in those components that tend to have the greatest imported content, such as food, energy and other goods (Chart 4.2). The rise in global oil prices in recent months has added somewhat to external cost pressures and is likely to feed through to retail fuel prices, and therefore to CPI inflation, relatively quickly.

Inflation is likely to rise further in the near term, peaking at 3.2% in October (Chart 4.1), before starting to fall back. The pace and extent of that fall will depend in part on the path for external and domestic cost pressures facing companies. Although the positive contribution of higher retail fuel prices is expected largely to have dissipated by the end of the year, the effect of the past fall in sterling on non-energy imported cost growth is expected to diminish only gradually (Section 4.2). Alongside that, domestic inflationary pressures are likely to build to more normal levels in coming years (Section 4.3). In particular, unit labour cost growth is expected to be supported by a gradual rise in wage growth in response to the tightening in labour market conditions. Inflation expectations remain consistent with inflation returning to the target in the medium term (Section 4.4).

Chart 4.3 Oil and metals prices have increased since the August Report

US dollar oil and commodity prices

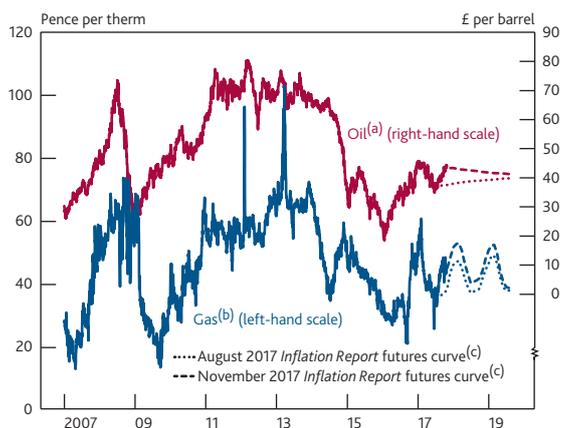


Sources: Bloomberg, S&P indices, Thomson Reuters Datastream and Bank calculations.

- (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.

Chart 4.4 Wholesale energy costs 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 averages to 26 July and 25 October 2017 respectively.

4.2 External cost pressures

The increase in inflation over the past year has been driven by an increase in the cost of imports, which forms a significant part of the costs facing UK companies. That, in turn, has largely reflected the depreciation of sterling, which, since the EU referendum, has remained 15%–20% below its peak in November 2015 (Section 1). The prices of some global commodities, such as oil and metals, have also picked up in recent months.

Energy

US dollar oil prices have risen since the August Report (Chart 4.3). Some of that rise is likely to have reflected stronger global demand (Section 1). Market contacts report that the disruption to supply from recent events, such as the Atlantic hurricane season, has also pushed up oil prices, as has the continued implementation of the November 2016 agreement between some oil producers to curb production over 2017.

The cost of oil accounts for around one third of the cost of retail fuel and tends to be passed on to fuel prices relatively quickly. The rise in global prices means that, in the run-up to the November Report, the price of oil was 17% higher in sterling terms than at the time of the August Report (Chart 4.4). The contribution of fuel prices to CPI inflation picked up in September (Section 4.1) and is expected to remain higher in the near term than was projected in August.

Although the spot price of oil has increased, the oil futures curve, on which the MPC's forecasts are conditioned, has moved by less and is now downward sloping (Chart 4.4). As a result, the contribution of fuel prices to overall inflation is expected to be more negative from 2018 H2 than projected in August (Section 5).

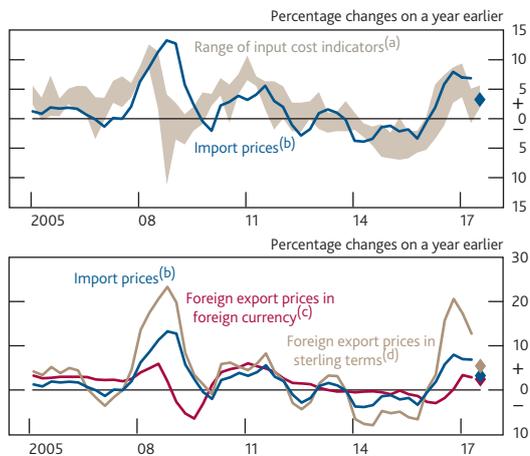
UK wholesale gas prices also tend to be influenced by changes in global oil prices. Consequently, sterling wholesale gas prices have risen since August, with the sterling gas futures curve, on which the MPC's projections are conditioned, around 5% higher (Chart 4.4). The pass-through of wholesale gas prices to retail prices tends to take much longer than for changes in oil prices and the degree of pass-through varies over time. In the near term, rises in retail electricity and gas prices by the major providers earlier in the year will continue to boost the contribution of utility prices to inflation until they drop out of the annual comparison in the first half of 2018 (Table 4.A).

Table 4.A Monitoring the MPC's key judgements

Developments anticipated in August during 2017 Q3–2018 Q1	Developments now anticipated during 2017 Q4–2018 Q2
Household energy prices	Broadly unchanged
<ul style="list-style-type: none"> Electricity and gas price rises to contribute slightly less than ¼ percentage point to CPI inflation. 	<ul style="list-style-type: none"> Electricity and gas prices to be flat during 2018 H1.
Import prices	Revised up slightly
<ul style="list-style-type: none"> Commodity prices to evolve in line with the conditioning assumptions. Non-fuel import prices to rise by 2¾% in the year to 2018 Q1. 	<ul style="list-style-type: none"> Oil prices have risen by 17%. Commodity prices to evolve in line with the conditioning assumptions. Non-fuel import prices to rise by 1¾% in the year to 2018 Q2.
Earnings growth	Broadly unchanged
<ul style="list-style-type: none"> Four-quarter growth in AWE regular pay to be around 2¼% in 2017 H2. 	<ul style="list-style-type: none"> Four-quarter growth in AWE regular pay to be around 2½% in 2018 H1.
Unit labour costs	Revised up slightly
<ul style="list-style-type: none"> Four-quarter growth in whole-economy unit labour costs to fall to around ¾% in Q3 before recovering towards 1½%. 	<ul style="list-style-type: none"> Four-quarter growth in whole-economy unit labour costs to average around 1¾%.
Inflation expectations	Broadly unchanged
<ul style="list-style-type: none"> Indicators of medium-term inflation expectations to continue to be broadly consistent with the 2% target. 	<ul style="list-style-type: none"> Indicators of medium-term inflation expectations to continue to be broadly consistent with the 2% target.

Chart 4.5 Import prices have continued to rise

Import prices, foreign export prices and indicators of input cost pressures



Sources: Bank of England, BCC, CBI, CEIC, Eurostat, IHS Markit, ONS, Thomson Reuters Datastream and Bank calculations.

- (a) Swathe includes: producer price index (PPI) imported materials prices; Markit/CIPS manufacturing input prices; BCC input cost pressures; CBI manufacturing average costs over the past three months (from the *Quarterly Industrial Trends Survey*); and Bank Agents' material costs scores. BCC and PPI data are not seasonally adjusted. Adjusted to match the mean and variance of import price growth, since 2000.
- (b) UK goods and services import deflator excluding fuels and the impact of MTIC fraud. Diamond shows Bank staff's projection for 2017 Q3.
- (c) Domestic currency non-oil export prices for goods and services of 51 countries weighted according to their shares in UK imports. The sample excludes major oil exporters. Diamond shows Bank staff's projection for 2017 Q3.
- (d) Domestic currency non-oil export prices as defined in footnote (b) divided by the sterling exchange rate index. Diamond shows Bank staff's projection for 2017 Q3.

Non-energy imported costs

Most of the increase in inflation over the past year has been driven by an increase in the cost of non-energy imports facing UK companies. Sterling non-energy import prices increased by 10% between 2015 Q4 and 2017 Q2, and are expected to rise further over 2018. By far the biggest driver of the rise in import prices has been the depreciation of sterling over this period (Chart 4.5). World export prices — the foreign currency prices companies in other countries charge for their exports, weighted according to countries' shares in UK imports — have also increased recently, with annual growth of 3% in Q2. In part, that reflects the recent pickup in oil and other commodity prices (Chart 4.3), which are inputs into the production of many other goods.

The pickup in import prices since the end of 2015 has been substantial, but to date it remains less than the average response to similarly sized falls in sterling over the past. As explained in the box on pages 28–29 of the November 2015 *Report*, Bank staff estimated that, on average, 60% of changes in the sterling value of world export prices tend to be reflected in UK import prices, with that pass-through taking around a year. As of 2017 Q2, only around 50% of the increase in world export prices in sterling terms has been reflected in higher import prices.

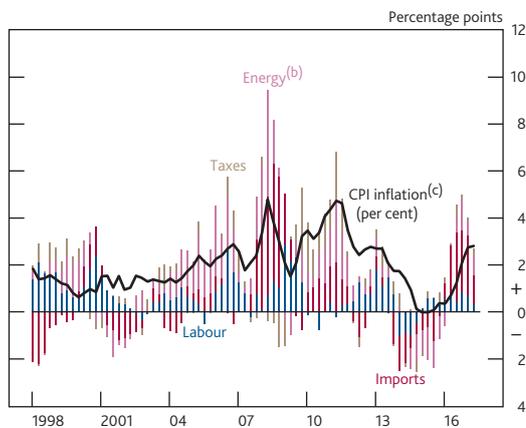
While this could suggest the overall rise in import prices will be more limited than in the past, there are reasons why pass-through to import prices is likely to be slower on this occasion. For example, elevated uncertainty before the referendum may have encouraged UK importers and foreign exporters to the United Kingdom to hedge their sterling exposures for longer periods than usual. That would delay the pace at which the fall in sterling is passed on to UK companies' input costs. Volatility in sterling may also have led foreign exporters to delay or moderate adjustments to their prices until they were more certain of the appropriate level. As a result, the past depreciation in sterling is projected to continue pushing up import prices in coming quarters. Survey measures of input cost growth remain consistent with that continued pass-through (Chart 4.5).

Import price pass-through to consumer prices

A natural consequence of the pass-through of rising import prices to consumer prices is an initial compression and then a gradual rebuild in the domestic profit margins on consumer goods and services. One measure of these margins — the difference between estimated costs, including import and labour costs, and consumer price inflation — suggests profit margins have narrowed since 2016 H1 as imported costs have increased (Charts 4.6 and 4.7).

Chart 4.6 External factors have driven most of the pickup in companies' costs in 2017

CPI inflation and estimated contributions to four-quarter growth in unit costs for consumer goods and services^(a)

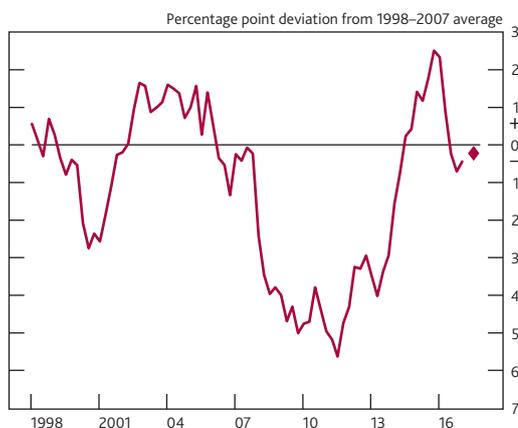


Sources: Office for Budget Responsibility (OBR), ONS and Bank calculations.

- (a) The underlying weights attached to each component are based on the *United Kingdom Input-Output Analytical Tables 2013*, adjusted to reflect the composition of CPI. Where applicable, the weights capture each factor's contribution to all stages of the domestic production process. 2017 Q3 figures for imports, labour and taxes are staff projections.
 (b) Includes imports, labour costs and tax associated with energy inputs.
 (c) Quarterly average of monthly changes on a year earlier, seasonally adjusted by Bank staff.

Chart 4.7 Consumer profit margins have narrowed since 2016 H1

Estimated margins on consumer goods and services^(a)



Sources: OBR, 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 relative to 1998–2007 averages. Costs consist of labour, imports, energy and taxes, weighted to reflect their intensity in CPI as shown in **Chart 4.6**. The diamond shows Bank staff's projection for 2017 Q3.

There is some uncertainty around estimates of profit margins, but a number of indicators point to a compression in consumer margins relative to those in the broader economy. That is consistent with exporters' profits having been boosted by the fall in sterling's exchange rate (Section 2).⁽¹⁾ Estimates derived from firms' financial accounts suggest that, while the operating margins of UK-focused firms in the FTSE All-Share index have narrowed since 2016, those of other companies in the index have not.⁽²⁾ And survey indicators of profitability — such as the EEF measure — and intelligence from the Bank's Agents suggest that margins on domestic sales have been lower than those on exports over the recent past.

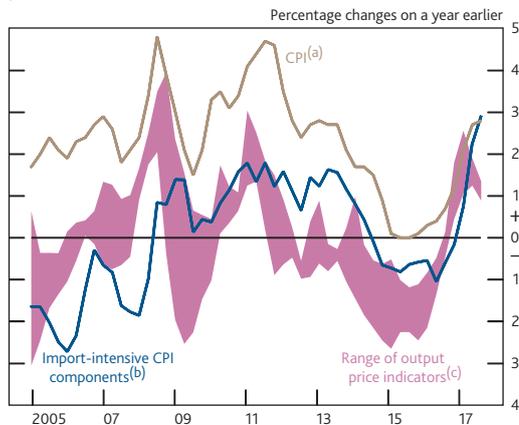
The pass-through of higher import prices, as companies try to restore their margins on consumer goods and services, has been the key driver of higher CPI inflation over the past year. It is likely to continue to push up inflation for several years as import costs continue to rise and as those margins are rebuilt. The precise impact on inflation will, however, depend on the speed at which companies rebuild their margins and the extent to which they do so by raising output prices or reducing other costs. Over the past, changes in import prices have tended to be passed on to consumer prices in aggregate broadly in line with the share of imported inputs in the CPI basket — around 30%. That tends to take place gradually, with annual inflation affected for around four years after the change in import prices.⁽³⁾

There is evidence that the pass-through of import prices to consumer prices is occurring more rapidly than on average in the past, which will have supported profit margins. As a result, although the response of import prices to the depreciation in sterling has been less than on average over the past, the CPI has risen by a little more than its average response. Moreover, inflation among import-intensive components of the CPI — those components that are imported or have a high share of imported inputs, such as food — has picked up particularly sharply (**Chart 4.8**). There are signs that cost pressures further back in the supply chain have moderated, in part as the fall in sterling is passed on, though indicators of companies' expected output prices — which capture the price of intermediate inputs into consumer goods and services — remain elevated.

(1) For more details, see Broadbent, B (2017), 'Brexit and the pound'; www.bankofengland.co.uk/publications/Documents/speeches/2017/speech969.pdf.
 (2) UK domestically focused companies are defined as those generating at least 70% of their revenues in the United Kingdom, based on annual financial accounts data on companies' geographic revenue breakdown.
 (3) See the box on pages 28–29 of the *November 2015 Report*; www.bankofengland.co.uk/publications/Documents/inflationreport/2015/nov.pdf.

Chart 4.8 Survey indicators suggest supply-chain price pressures have moderated slightly

Import-intensive CPI inflation and survey indicators of output price inflation



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

- (a) Quarterly data.
 (b) The import-intensive CPI series weights together the 20 CPI components with the highest import intensities accounting for indirect imported inputs, excluding fuel and administered and regulated prices. Import-intensive CPI data have been adjusted by Bank staff for changes in the rate of VAT, although there is uncertainty around the precise impact of those changes. Quarterly average of monthly data.
 (c) Indicators included in swathe are: manufacturing output producer price index excluding food, beverages and tobacco; Markit/CIPS output prices for manufacturing; CBI Industrial Trends expected selling prices; and Bank Agents' finished imported goods cost scores. Adjusted to match the mean and variance of import-intensive inflation since 2001.

Table 4.B Pay growth remains subdued

Indicators of pay growth

	Quarterly averages						
	2002–07	2010–12	2013–14	2015	2016	2017 H1	2017 Q3
Average weekly earnings (per cent)							
Whole-economy total pay ^(a)	4.2	1.9	1.1	2.6	2.5	2.2	2.2
Private sector total pay ^(a)	4.2	1.9	1.4	3.0	2.6	2.4	2.4
Whole-economy regular pay ^{(a)(b)}	3.9	1.8	1.0	2.5	2.4	2.0	2.1
Private sector regular pay ^{(a)(b)}	3.8	1.7	1.3	2.9	2.7	2.2	2.3
Survey indicators of pay growth							
CBI ^(c)	n.a.	1.6	1.8	2.3	2.2	2.5	2.4
Agents ^(d)	2.4	1.3	1.5	2.0	1.9	1.9	1.8
CIPD ^(e)	n.a.	1.2	1.8	1.8	1.4	1.0	n.a.
BCC ^(f)	29.1	19.9	22.4	25.6	23.4	18.9	15.5
Survey indicators of pay growth for new recruits							
REC ^(g)	56.7	52.4	59.0	61.9	57.1	58.9	60.8

Sources: Bank of England, BCC, CBI, CBI/PwC, Chartered Institute of Personnel and Development (CIPD), KPMG/REC/IHS Markit, ONS and Bank calculations.

- (a) Quarterly average growth on the same period a year earlier. Figures for 2017 Q3 are data for the three months to August.
 (b) Total pay excluding bonuses and arrears of pay.
 (c) Measures of expected pay for the year ahead. Produced by weighting together balances for manufacturing, distributive trades, business/consumer/professional services and financial services using employee job shares. Data only available since 2008.
 (d) Quarterly averages for manufacturing and services weighted together using employee job shares. The scores refer to companies' labour costs over the past three months compared with the same period a year earlier. Scores of -5 to 5 represent rapidly falling and rapidly rising costs respectively, with zero representing no change.
 (e) Pay increase intentions excluding bonuses over the coming year. Data only available since 2012.
 (f) Net percentage balance of companies currently facing pressures to raise prices due to pay settlements. Produced by weighting together survey indices for pay settlements for services and non-services using employee job shares.
 (g) Produced by weighting together survey indices for the pay of permanent and temporary new placements using employee job shares; quarterly averages. A reading above 50 indicates growth on the previous month and those below 50 indicate a decrease.

4.3 Domestic cost pressures

While external cost pressures are set to wane over the next couple of years, the absorption of slack in the domestic economy (Section 3) means that domestic cost pressures are likely to build to more normal levels.

The largest domestic cost facing most companies is the cost of labour. The degree to which those costs affect inflation will depend on growth in unit labour costs (ULCs) — the labour costs associated with producing a unit of output. ULC growth will reflect wage growth, alongside growth in the other labour costs facing companies, and how both of those evolve relative to growth in productivity.

Despite the continued fall in unemployment (Section 3), pay growth remains subdued. In the past, lower unemployment has typically been associated with higher pay growth (Chart 4.9), as it becomes more difficult for companies to recruit and retain employees.⁽¹⁾ Average weekly earnings (AWE) pay growth increased only a little in the three months to August, however, with annual growth in regular pay, excluding bonuses, at 2.3% in the private sector and 2.1% across the whole economy (Table 4.B). Pay growth for those on lower wages appears to have been somewhat higher in the year to 2017 Q2, according to the latest Annual Survey of Hours and Earnings, probably reflecting the effects of the National Living Wage.

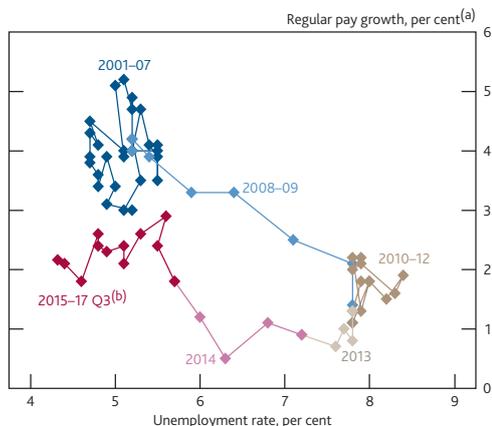
Much of the weakness in pay growth in recent years will have reflected weak productivity growth (Section 3), reducing the drag on companies' cost pressures. Consistent with that, ULC growth (Chart 4.10) has been much less subdued than wage growth, relative to their past averages. Recent upward revisions by the ONS to the size of companies' pension contributions as well as downward revisions to productivity growth (Section 3) mean that ULC growth is now estimated to have been higher over the past few quarters than at the time of the August Report.

One specific factor that may have weighed on both wage and productivity growth in recent quarters — and so limited the impact of weak wage growth on domestic cost pressures — is changes in the composition of the workforce.⁽²⁾ Bank staff estimate that the growth in employment in the four quarters to 2017 Q2 has been disproportionately in occupations and industries typically associated with lower wages. If growth in employment is being driven by those earning less than the

- (1) For a wider discussion of global influences on the wage Phillips curve, see Carney, M (2017), '[De]Globalisation and inflation'; www.bankofengland.co.uk/publications/Pages/speeches/2017/996.aspx.
 (2) For a more in-depth discussion of the role of composition of the UK workforce over the past, see Abel, W, Burnham, R and Corder, M (2016), 'Wages, productivity and the changing composition of the UK workforce', *Bank of England Quarterly Bulletin*, Vol. 56, No. 1, pages 12–22; www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2016/q1.pdf.

Chart 4.9 Wage growth has remained subdued as the unemployment rate has fallen

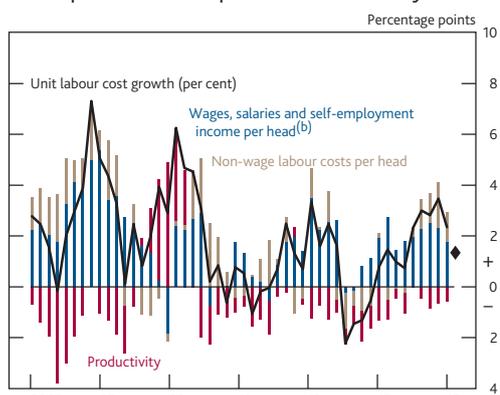
Wage Phillips curve: wage growth and unemployment



(a) Whole-economy average weekly earnings (AWE) total pay excluding bonuses and arrears of pay. Percentage change on a year earlier.
 (b) Diamond for 2017 Q3 shows Bank staff's projections, based on data to August.

Chart 4.10 Unit labour cost growth has been less subdued than wage growth

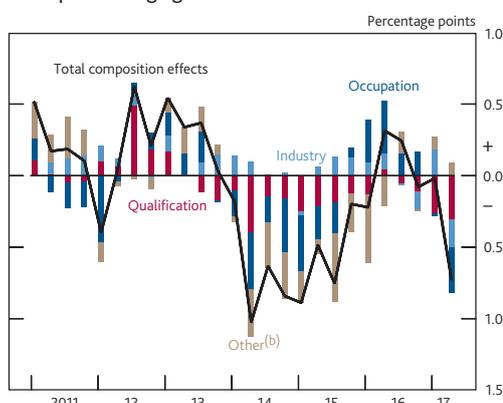
Decomposition of four-quarter whole-economy unit labour cost growth^(a)



(a) Whole-economy labour costs divided by real GDP, based on the backcast of the final estimate of GDP. The diamond shows Bank staff's projection for 2017 Q3.
 (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 4.11 Recent changes in the composition of employment may have pushed down wage growth

Estimates of the contribution of employment characteristics to four-quarter wage growth^(a)



Sources: Labour Force Survey and Bank calculations.

(a) Estimates are shown relative to their averages over 1995 Q2–2017 Q2. Estimates of the effect of individual and job characteristics are derived from a regression of these characteristics on levels of employee pay using Labour Force Survey data. The estimate of the total composition effect is obtained by combining these estimates with changes in the composition of the labour force.
 (b) Other includes age, tenure, gender, region of residence, whether working full-time and whether in public sector employment.

average wage, then that will push down measured average wage growth, even if the wage growth of those already in work is unchanged.

This recent shift in the composition of labour is estimated to account for around 0.7 percentage points of the weakness in pay growth in Q2 (Chart 4.11), although there is considerable uncertainty around this estimate. To the extent that the impact on pay growth of those compositional effects reflects a relatively lower level of productivity, measured productivity growth would be expected to be commensurately lower (Section 3). As a result, ULC growth, and hence domestic labour cost pressures, will have been much less affected.

Wage growth is projected to increase gradually over 2018, as the tightening labour market starts to put more widespread upward pressure on wage demands and as productivity growth recovers somewhat. Although most survey indicators suggest that wage growth is likely to remain modest in the near term, there are some signs that wage demand pressures have increased. Churn in the labour market has remained robust over recent quarters, with the proportion of people moving from one job to another close to its pre-crisis rate (Chart 4.12). That could suggest continued confidence among employees in their labour market prospects, which may place pressure on businesses to retain staff by increasing wages. Consistent with that, the REC survey continues to suggest wage growth has risen for new recruits (Table 4.B). And the Bank's Agents also report a greater willingness among companies to increase pay growth, relative to earlier in the year, particularly for new recruits and key staff. Perhaps acting against that, another factor that may have been influencing pay decisions recently is companies' uncertainty around the economic outlook. This could affect their willingness to raise pay at a faster pace until they have more clarity about future demand for their output.

ULC growth is expected to have slowed in Q3 (Chart 4.10), reflecting the effect of higher pension contributions in 2016 H2 starting to drop out of the annual comparison and reducing the contribution from non-wage costs. Further ahead, the gradual recovery in pay growth, alongside an increase in non-wage costs — as the phasing in of automatic enrolment in workplace pension schemes continues — and continued weak productivity growth, means that ULC growth is projected to rise from mid-2018 (Section 5).

4.4 Inflation expectations

Inflation expectations may influence wage and price-setting behaviour. For example, if companies and households become less confident that inflation will return to the MPC's 2% target, that may lead to changes in wage and price-setting that make inflation persist above the target for longer.

Chart 4.12 Job-to-job flows remain around pre-crisis ratesJob-to-job flows^(a)

Sources: Labour Force Survey and Bank calculations.

(a) Number of people who reported being in a job three months ago and report currently being in a job for less than three months. Seasonally adjusted by Bank staff.

The MPC monitors a range of indicators — derived from financial market prices and surveys of households and companies — to assess whether inflation expectations remain consistent with its target. Most of these indicators suggest that inflation expectations were broadly unchanged in the latest data (**Table 4.C**) and were consistent with a return to the target over coming years. Indicators of long-term inflation expectations remain around their past averages. And indicators of shorter-term inflation expectations — which tend to respond more to changes in actual inflation and the near-term outlook — have also been broadly stable, despite the recent further pickup in CPI inflation.

Overall, the MPC judges that inflation expectations remain well anchored, and that indicators of medium-term inflation expectations continue to be broadly consistent with a return of inflation to the 2% target.

Table 4.C Indicators of inflation expectations^(a)

Per cent

	2000 (or start of series) to 2007 averages ^(b)	Averages since 2008	2015	2016		2017		
				H1	H2	H1	Q3	Q4 ^(c)
One year ahead inflation expectations								
Households^(d)								
Bank/GfK/TNS ^(e)	2.4	3.0	2.0	1.9	2.5	2.9	2.8	n.a.
Barclays Basix	2.8	2.8	1.5	1.7	2.0	2.3	2.4	n.a.
YouGov/Citigroup (Nov. 2005)	2.5	2.4	1.3	1.5	2.1	2.6	2.5	2.8
Companies (2008 Q2)^(f)	n.a.	0.6	0.4	0.4	0.9	1.5	1.2	n.a.
Financial markets (Oct. 2004)^(g)	2.6	2.8	2.5	2.5	3.2	3.5	3.4	3.2
Two to three year ahead expectations								
Households^(d)								
Bank/GfK/TNS (2009 Q1) ^(e)	n.a.	2.7	2.3	2.2	2.4	2.8	2.7	n.a.
Barclays Basix	3.2	3.0	1.9	2.2	2.4	2.9	2.8	n.a.
Professional forecasters (2006 Q2)^(h)	2.0	2.1	2.1	2.1	2.1	2.1	2.0	1.9
Financial markets (Oct. 2004)⁽ⁱ⁾	2.8	3.0	3.0	2.8	3.2	3.4	3.2	3.3
Five to ten year ahead expectations								
Households^(d)								
Bank/GfK/TNS (2009 Q1) ^(e)	n.a.	3.2	2.8	3.2	3.1	3.3	3.4	n.a.
Barclays Basix (2008 Q3)	n.a.	3.7	3.1	3.6	3.4	3.9	3.9	n.a.
YouGov/Citigroup (Nov. 2005)	3.5	3.2	2.7	2.7	2.7	3.0	3.1	3.2
Financial markets (Oct. 2004)⁽ⁱ⁾	3.0	3.4	3.3	3.1	3.3	3.4	3.3	3.4
Memo: CPI inflation	1.6	2.4	0.0	0.4	1.0	2.4	2.8	n.a.

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

(a) Data are not seasonally adjusted.

(b) Dates in parentheses indicate start date of the data series.

(c) Financial markets data are averages to 25 October 2017. YouGov/Citigroup data are for October.

(d) The household surveys ask about expected changes in prices but do not reference a specific price index.

(e) The measures are based on the median estimated price change.

(f) In 2016 Q1, the survey provider changed from GfK to TNS.

(g) CBI data for the manufacturing, business/consumer services and distributive trade 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.

5 Prospects for inflation

CPI inflation has risen further above the 2% target as companies pass on the higher costs stemming from the lower level of sterling. Unemployment has continued to fall and the extent of spare capacity in the economy now seems limited. Moreover, the pace at which the economy can grow without generating inflationary pressure has fallen over recent years. Over the MPC's forecast period, conditioned on a path for Bank Rate that rises to 1% by the end of 2020, demand is projected to grow at a pace that uses up the remaining slack in the economy. As imported inflationary pressures wane, domestic pressures build. Inflation is projected to remain slightly above the 2% target at the three-year point. At its meeting ending on 1 November 2017, the MPC voted to increase Bank Rate to 0.5%.

Table 5.A Forecast summary^{(a)(b)}

	Projections			
	2017 Q4	2018 Q4	2019 Q4	2020 Q4
GDP ^(c)	1.5 (1.3)	1.7 (1.8)	1.7 (1.7)	1.7
<i>Excluding backcast</i>	1.4 (1.2)	1.7 (1.8)	1.7 (1.8)	1.7
CPI inflation ^(d)	3.0 (2.8)	2.4 (2.5)	2.2 (2.2)	2.1
LFS unemployment rate	4.2 (4.4)	4.2 (4.5)	4.2 (4.5)	4.3
Bank Rate ^(e)	0.4 (0.3)	0.7 (0.5)	0.9 (0.7)	1.0

(a) Modal market rate projections for GDP, CPI inflation and LFS unemployment. Figures in parentheses show the corresponding projections in the August 2017 *Inflation Report*. Projections were only available to 2020 Q3 in August.

(b) The November projections have been conditioned on the assumptions that the stock of purchased gilts remains at £435 billion and the stock of purchased corporate bonds remains at £10 billion 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 August projections were conditioned on the same asset purchase and TFS assumptions.

(c) Four-quarter growth in real GDP. The MPC's projections are based on its backcast for GDP.

(d) Four-quarter inflation rate.

(e) Per cent. The path for Bank Rate implied by forward market interest rates. The curves are based on overnight index swap rates.

Table 5.B Conditioning path for Bank Rate implied by forward market interest rates^(a)

Per cent	2017		2018				2019				2020			
	Q4 ^(b)		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
November	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	
August	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.8		

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

(b) November figure for 2017 Q4 is an average of realised overnight rates to 25 October 2017, and forward rates thereafter.

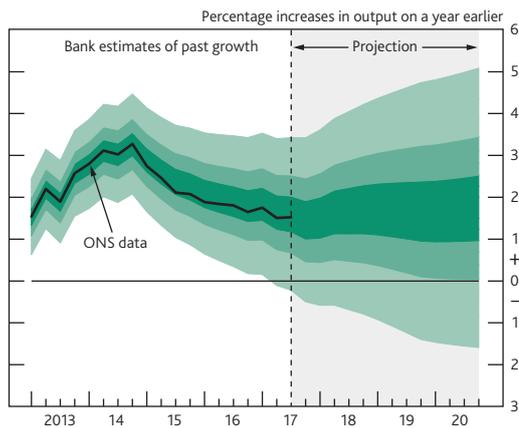
Growth over the past year has been supported by resilient consumer confidence (**Chart 1.2**), the stronger world economy (**Chart 1.1**), the small loosening in fiscal policy relative to previous plans and the MPC's comprehensive package of measures in August 2016. Credit conditions facing UK households (**Chart 1.14**) and companies (**Chart 1.11**) have eased further, and exporters have also benefited from a lower level of sterling. Unemployment has fallen to a 42-year low and the level of remaining slack is limited. CPI inflation has risen above the MPC's 2% target as expected, as the sharp fall in sterling has begun to pass through into consumer prices.

Over the past few months, market expectations for the path of Bank Rate have risen. The MPC's projections, summarised in **Table 5.A**, are conditioned on a path that implies a gradual rise in Bank Rate to 1.0% by the end of 2020, and is around ¼ percentage point higher than that in the August 2017 *Report* (**Table 5.B**).⁽¹⁾ The exchange rate has been volatile but starts the projection at a similar level to August. Overall, there is a little less monetary stimulus in these projections than assumed in August.

The 18% decline in sterling since late 2015 largely reflects financial market participants' judgements about the impact of Brexit on the United Kingdom. Those judgements depend on assumptions about the United Kingdom's trading relationships after Brexit and about the transition to those arrangements.

(1) Unless otherwise stated, the projections shown in this section are conditioned on: Bank Rate following a path implied by market yields; the stock of purchased gilts remaining at £435 billion and the stock of purchased corporate bonds remaining at £10 billion throughout the forecast period and the Term Funding Scheme (TFS), all three of which are financed by the issuance of central bank reserves; 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 2017 March *Budget*; 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/novca.pdf.

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.

As in previous *Reports*, the MPC's projections are conditioned on the average of a range of possible outcomes for the United Kingdom's trading relationship with the European Union. They also assume that households and companies base their decisions on the expectation of a smooth adjustment to those new trading arrangements.

The outlook for UK growth is set against a backdrop of strong global growth (Key Judgement 1), with recent data pointing to more momentum than had been projected in August. That strength, along with the lower sterling exchange rate, supports UK trade (Key Judgement 2). Business investment is projected to grow at a moderate pace but by less than would have been suggested by global demand and financial conditions alone, as uncertainty around Brexit weighs on companies' plans. Household spending growth has slowed as higher import costs have squeezed real incomes. Real income and spending growth are projected to recover gradually as nominal pay growth picks up and imported inflation falls back. Overall, demand growth is projected to remain modest over the forecast period (Chart 5.1).

The pace at which the economy can grow without generating inflationary pressure has fallen relative to pre-crisis norms. This reflects persistent weakness in productivity growth and, more recently, the more limited availability of labour. That means modest demand growth uses up the little spare capacity remaining in the economy over the forecast period (Key Judgement 3). As a result, domestic inflationary pressures are judged likely to build as the boost from imported inflation diminishes (Key Judgement 4). Inflation is projected to peak at around 3¼% in October, a bit higher than expected three months ago (Chart 5.3), before falling back to end the forecast period slightly above the 2% target (Chart 5.2).

At its meeting ending on 1 November 2017, the MPC voted to increase Bank Rate to 0.5%, to maintain the stock of sterling non-financial investment-grade corporate bond purchases, financed by the issuance of central bank reserves, at £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.⁽¹⁾ The remainder of this section sets out the MPC's projections, and the risks around them, in more detail.

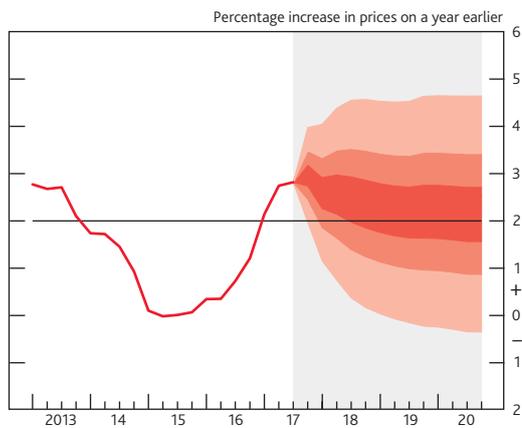
5.1 The MPC's key judgements and risks

Key Judgement 1: global growth remains strong

Global growth has picked up significantly over the past year across advanced and emerging economies. Moreover,

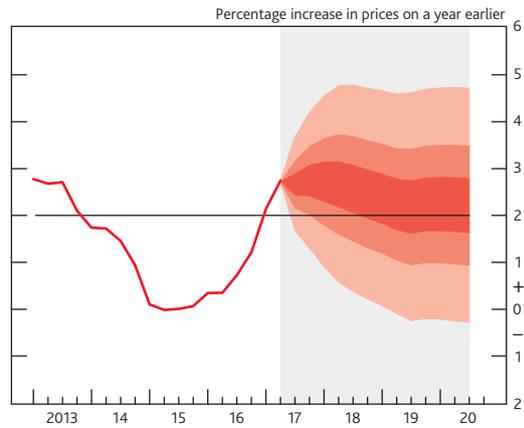
(1) The Minutes are available at www.bankofengland.co.uk/publications/minutes/Documents/mpc/pdf/2017/nov.pdf.

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.

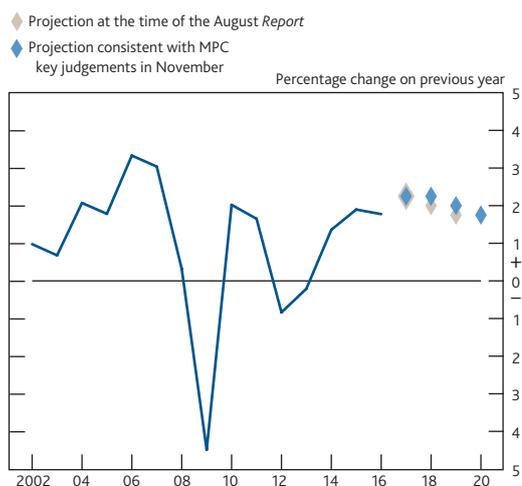
Chart 5.3 CPI inflation projection in August based on market interest rate expectations, other policy measures as announced



strengthening indicators of global investment, such as capital goods orders, suggest that growth is becoming more broadly based.

The pickup has been particularly marked in the euro area (Section 1), where considerable spare capacity had built up earlier this decade. Monetary stimulus, together with improving credit conditions and confidence, has led output to grow above its potential rate and some of that slack to be absorbed. The outlook for growth depends in part on how much slack is left.

Chart 5.4 Euro-area GDP^(a)



Sources: Eurostat and Bank calculations.

(a) Calendar-year growth rates. Chained-volume measure. Projections were only available to 2019 at the time of the August Report.

Unemployment has fallen significantly from its peaks in all euro-area countries but remains above pre-crisis rates in most. Recent outturns for wages show less upward pressure on pay from those falls in unemployment than might have been expected, suggesting that the equilibrium unemployment rate may have fallen. In part, that is likely to reflect structural reforms to labour markets in several countries. Given that, together with evidence on broader indicators of labour market conditions, the MPC judges that there is still significant slack to be absorbed in the euro area. That means that growth can continue at around current rates in the near term, before falling back towards potential further out, a higher projection than that of three months ago (Chart 5.4).

Recent data also point to slightly stronger US GDP growth in the near term than previously expected (Section 1). Growth is projected to slow to around its potential rate over the forecast period (Table 5.C). Elsewhere in the world, there has been little news to change the MPC's projections. In China, growth is still projected to slow towards 6% over the next three years. Alongside this, credit is expected to continue to grow at a rapid pace and significant risks to financial stability are expected to remain. Growth in other emerging economies has

Table 5.C MPC key judgements^{(a)(b)}**Key Judgement 1: global growth remains strong**

	Average 1998– 2007	Projections			
		2017	2018	2019	2020
World GDP (UK-weighted) ^(c)	3	2¾ (2½)	2¾ (2½)	2½ (2½)	2¼
World GDP (PPP-weighted) ^(d)	4	3½ (3½)	3¾ (3½)	3½ (3½)	3½
Euro-area GDP ^(e)	2¼	2¼ (2¼)	2¼ (2)	2 (1¾)	1¾
US GDP ^(f)	3	2¼ (2)	2¼ (2)	2 (2¼)	1¾

Key Judgement 2: investment and net trade support UK demand, while consumption growth remains subdued

	Average 1998– 2007	Projections			
		2017	2018	2019	2020
Business investment to GDP ratio ^(g)	9¾	9½ (9¼)	9½ (9½)	9½ (9½)	9¾
Credit spreads ^(h)	¾ ⁽ⁱ⁾	1¾ (1¾)	1¾ (1¾)	1¾ (1¾)	2
Household saving ratio ^(j)	8½	5¼ (3)	5¼ (3)	4¾ (2¾)	4¾

Key Judgement 3: with little slack remaining and diminished growth in potential supply, modest demand growth is sufficient to restore domestic inflationary pressure

	Average 1998– 2007	Projections			
		2017	2018	2019	2020
Productivity ^(k)	2¼	¼ (½)	1¼ (1½)	1½ (1½)	1¼
Participation rate ^(l)	63	63½ (63½)	63½ (63½)	63½ (63¾)	63¾
Average hours ^(m)	32¼	32¼ (32)	32 (32)	31¾ (31¾)	31¾

Key Judgement 4: significant upward pressure on inflation from import and energy prices eases over the forecast period and domestic inflationary pressures build

	Average 1998– 2007	Projections			
		2017	2018	2019	2020
UK import prices ⁽ⁿ⁾	¼	2½ (2)	1¾ (2)	½ (¾)	½
Dollar oil prices ^(o)	39	57 (49)	56 (51)	55 (53)	55
Unit labour costs ^(p)	3	1¾ (1¼)	2 (1¾)	2¼ (2¼)	2¼

Sources: Bank of America Merrill Lynch Global Research (used with permission), Bank of England, BDRG 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 August 2017 *Inflation Report*. Projections were only available to 2019 at the time of the August *Report*.
- (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.
- (f) Chained-volume measure.
- (g) Calendar-year average. Chained-volume business investment as a percentage of GDP.
- (h) 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.
- (i) 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.
- (j) Calendar-year average. Percentage of total available household resources. The ONS has revised the level of the saving ratio since the August *Report* (see the box on pages 12–13).
- (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 inflation rate in Q4.
- (o) Average level in Q4. Dollars per barrel. Projection based on monthly Brent futures prices.
- (p) 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.

recovered over the past year or so and is projected to remain steady over the forecast period.

Based on PPP weights, global activity is projected to expand at 3¾% in 2018 before slowing a touch to 3½% (Table 5.C).

Weighted by UK export shares, growth is around 2¾%, slowing to 2¼% by 2020. That is a slightly higher projection than three months ago, reflecting the stronger outlooks for the euro area and United States. The risks around the projection are judged to be balanced.

Key Judgement 2: investment and net trade support UK demand, while consumption growth remains subdued

UK growth has been modest in recent quarters and its composition has rotated towards net trade and business investment and away from consumption (Section 2). That pattern continues over the forecast period as households continue to adjust to lower levels of real income.

The combination of the stronger global economy and the lower sterling exchange rate is supporting UK exports. Given weaker domestic demand, imports have grown more sluggishly than exports and net trade has supported UK growth over the past year. Over much of the forecast period, that support continues, consistent with the strength in world demand relative to that in the United Kingdom and the lower exchange rate. As in previous *Reports*, both exports and imports grow relatively slowly compared with their historical relationships with demand and the exchange rate, as companies here and abroad begin to adjust trading relationships in light of the United Kingdom's vote to withdraw from the European Union (Table 5.D).

The latest data show somewhat stronger UK business investment growth over the past year than previously estimated. Over the recent past and during the forecast period, business investment is supported by external demand, the limited spare capacity in firms and the continuing low cost of finance (the box on pages 18–21 discusses the sensitivity of companies to higher interest rates). Investment growth is, however, more modest than would have been expected given these conditions alone — probably as a result of the drag on companies' investment plans from the anticipation of and uncertainty around Brexit, as suggested by a range of survey evidence and contacts of the Bank's Agents. Overall, business investment is projected to grow at a little above current rates (Table 5.D) and to end the forecast well below levels projected prior to the referendum.

Households' spending depends on their incomes and also on their decisions on saving and borrowing. Household real income growth has slowed sharply over the past year largely as a result of the increase in inflation associated with sterling's depreciation (Key Judgement 4). Aggregating across all households, income growth has been supported by solid

Table 5.D Indicative projections consistent with the MPC's modal projections^(a)

	Average 1998– 2007	Projections			
		2017	2018	2019	2020
Household consumption ^(b)	3½	1½ (1¾)	1 (¾)	1¼ (1¼)	1½
Business investment ^(c)	1¾	2½ (1)	2¾ (2¾)	3 (3½)	3
Housing investment ^(d)	3¼	4 (2¾)	1¼ (1¾)	¼ (1)	½
Exports ^(e)	4½	4¾ (3½)	2 (2¼)	1¼ (1¼)	½
Imports ^(e)	6	3 (3¼)	¼ (½)	-¼ (0)	-¼
Real post-tax household income ^(f)	3¼	-½ (-½)	1 (¾)	¾ (1)	1½
Employment ^(g)	1	1 (1)	¾ (½)	½ (¾)	¾
Average weekly earnings ^(h)	4¼	2¼ (2)	3 (3)	3¼ (3¼)	3¼

(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 August 2017 *Inflation Report*. Projections were only available to 2019 at the time of the August 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.

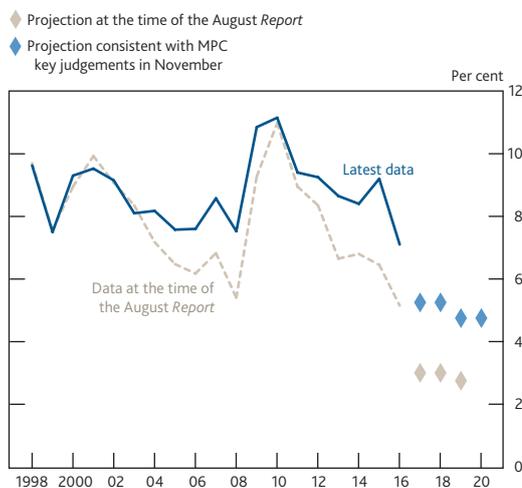
(f) Total available household resources deflated by the consumer expenditure deflator.

(g) Four-quarter growth rate in Q4.

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

growth in employment. Over the forecast period, real wage growth rises gradually as nominal pay growth picks up and imported inflation falls back (Key Judgement 4), although there is less support to aggregate income from employment growth.

Changes in interest rates affect both current incomes and the incentive to spend today rather than in the future. The MPC's November projection is conditioned on a path for Bank Rate that rises to around 1% in three years' time. Higher interest rates raise interest income for those with deposits and raise interest payments for those with loans. As set out in the box on pages 18–21, although there is uncertainty about the impact of higher rates, there is little reason to expect the impact of a rate rise to be greater than in the past. Household debt to income has fallen back from its 2008 peak, while deposits have risen relative to income. Around 60% of the stock of mortgages is at fixed rates, a higher proportion than when interest rates were raised in the past. People holding those mortgages will only face changes in their interest payments when the fixed term of their deal ends. Moreover, past falls in credit spreads (Section 1) mean that current fixed-rate deals are lower than those prevailing two to five years ago. Someone moving from an expiring five-year deal to a new one could see rates fall by roughly 200 basis points and for two-year deals the fall in rates could be around 30 basis points. Evidence from the latest NMG survey suggests that the proportion of households with particularly high debt-servicing ratios, who might be more likely to cut spending markedly in the face of an income shock, remains well below pre-crisis average levels. It would probably take a further rise of around 1½ percentage points in interest rates before this proportion returned to its pre-crisis average of 2%, even assuming no rise in nominal incomes.

Chart 5.5 Household saving rate^(a)

Sources: ONS and Bank calculations.

(a) Calendar-year average. Percentage of total available household resources. The ONS has revised the level of the saving ratio since the August Report (see the box on pages 12–13). Projections were only available to 2019 at the time of the August Report.

Consumption growth has slowed over the past year as households have begun to adjust spending to the lower level of income implied by the fall in sterling. Annual consumption growth is projected to slow a little further next year, as households continue to adjust to past falls in real wages, with annual growth then rising back to 1½% by the end of the forecast period (Table 5.D). In the central projection, the saving ratio is broadly flat (Chart 5.5) and consumer credit growth continues to slow from current high rates. It is possible that households will want to maintain a higher rate of spending in the near term despite weakness in their income, implying a declining saving ratio. In the other direction, households could increase saving or cut back borrowing if, for example, they were to become more pessimistic or uncertain about their income prospects.

The housing market is also sensitive to households' views of their income prospects and the path of interest rates. House price inflation has slowed over the past year, but recent outturns have been a little above expectations three months

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 assess 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 Q4 to 2018 Q2 if judgements evolve as expected
1: global growth remains strong	<ul style="list-style-type: none"> Quarterly euro-area GDP growth to average a little above ½%. Quarterly US GDP growth to average a little above ½%. Indicators of activity consistent with four-quarter PPP-weighted emerging market economy growth of around 4¾%; within that, GDP growth in China to average a little above 6½%.
2: investment and net trade support UK demand, while consumption growth remains subdued	<ul style="list-style-type: none"> Quarterly growth in UK business investment to average ¾%. Net trade to provide a small boost to quarterly UK GDP growth, on average. Real post-tax household income to increase slightly in the first half of 2018. Quarterly consumption growth to average ¼%. Household debt to income ratio, excluding student loans, to be broadly flat. Credit spreads to be broadly flat. Mortgage approvals for house purchase to average around 68,000 per month. The average of the Halifax/Markit and Nationwide house price indices to increase by just under ¾% per quarter, on average. After picking up in Q3, quarterly housing investment growth to average just over ¼%.
3: with little slack remaining and diminished growth in potential supply, modest demand growth is sufficient to restore domestic inflationary pressure	<ul style="list-style-type: none"> Unemployment rate to remain around its current level of 4¼%. Participation rate to remain around its current level of 63½%. Average weekly hours worked to be broadly flat at just over 32. Quarterly hourly labour productivity growth to average just under ½% in 2018 H1.
4: significant upward pressure on inflation from import and energy prices eases over the forecast period and domestic inflationary pressures build	<ul style="list-style-type: none"> Four-quarter growth in AWE regular pay to be around 2½% in 2018 H1. Four-quarter growth in whole-economy unit labour costs to average around 1¾%. Non-fuel import prices to rise by 1¾% in the year to 2018 Q2. Electricity and gas prices to be flat during 2018 H1. Commodity prices and sterling ERI to evolve in line with the conditioning assumptions set out in www.bankofengland.co.uk/publications/Documents/inflationreport/2017/novca.pdf. Indicators of medium-term inflation expectations to continue to be broadly consistent with the 2% target.

ago. Over the forecast period, house prices are projected to continue to grow around current rates (Table 5.E). Housing investment growth, which has been supported recently by unusually strong housebuilding activity, is projected to slow over 2018, as in August (Table 5.D).

Key Judgement 3: with little slack remaining and diminished growth in potential supply, modest demand growth is sufficient to restore domestic inflationary pressure

The economy can only grow so fast without putting upward pressure on inflation. That potential rate of growth will vary over time. Since the financial crisis, the United Kingdom has had significant spare capacity. That meant the economy could grow at a fairly rapid pace without putting significant upward pressure on inflation, as it did in 2014–15. As that spare capacity is used up, however, growth at above potential rates is likely to lead to more material upward pressure on inflation.

Moreover, that potential rate now seems lower than in the past, reducing the speed at which demand can grow sustainably.

An important indicator of labour market slack is the unemployment rate, which peaked at over 8% in 2011. It has since fallen back to 4.3%, its lowest rate in 42 years and below the MPC's estimated equilibrium unemployment rate of around 4½%. As set out in a box in the February 2017 Report, there remains considerable uncertainty around this estimate. Developments in output and inflation suggest that there may be a little spare capacity in the economy. Taking all the evidence together, the MPC judges that the output gap narrowed over 2017, and by more than expected three months ago.

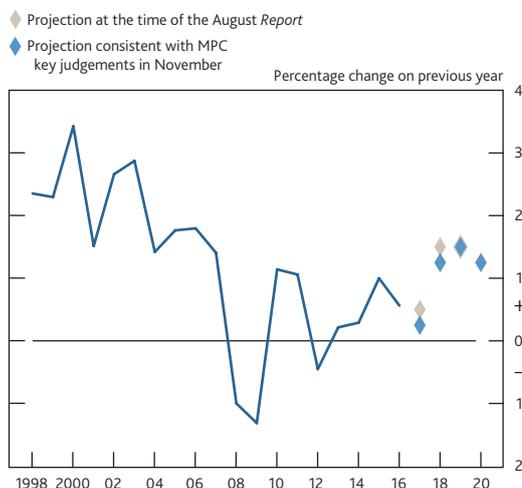
With little slack remaining, the speed at which the economy can grow will depend on the pace at which its supply capacity expands. During the economic recovery, potential supply growth was driven to an unusual extent by potential labour supply rather than potential productivity. Growth in potential labour supply reflected falling equilibrium unemployment and high net inward migration flows (Section 3). More recently potential labour supply growth has eased, and is projected to remain stable over the forecast period, based on ONS projections for population growth, which incorporate a further fall in net inward migration flows (Section 3). That means supply growth will be more reliant on productivity growth.

Productivity has barely grown over the past ten years, compared with growth rates of around 2¼% a year on average before then. The weakness in recent years in part reflects low levels of investment and the resulting low growth in the capital stock. It also reflects unusually weak growth in total factor productivity (TFP), the efficiency with which companies use their resources to produce output. The MPC, like other forecasters, has repeatedly marked down its projected recovery in productivity growth over recent years.

Firms' anticipation of and response to post-Brexit trading relationships are also likely to weigh on productivity growth. Uncertainty is probably holding back investment (Key Judgement 2). A need to reorientate production and supply chains would be likely to weigh on TFP growth, as would a reduction in openness. Taking all influences together, potential productivity is projected to grow at around 1% a year. Measured hourly productivity growth has been very weak in recent quarters. It is projected to pick up above potential as that weakness unwinds, before falling back (Chart 5.6) towards its estimated trend rate.

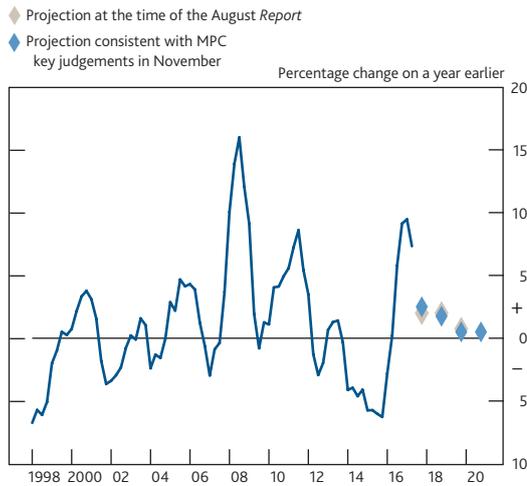
The MPC judges that UK potential supply growth is likely to remain modest over the forecast period at around 1½%. With little spare capacity at the start of the forecast period, that means that demand can grow only at a modest pace if

Chart 5.6 Productivity^(a)



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. Projections were only available to 2019 at the time of the August Report.

Chart 5.7 Import price inflation^(a)

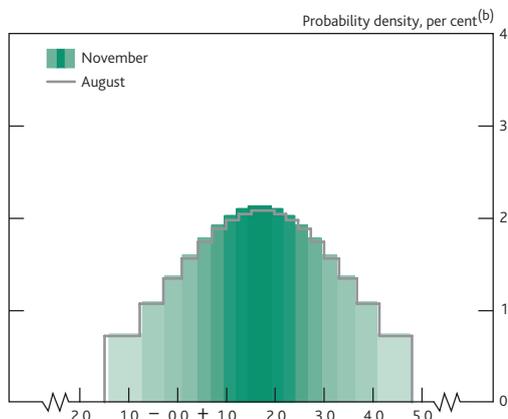
(a) Projections are four-quarter inflation rate in Q4. Excludes the impact of MTIC fraud. Projections were only available to 2019 at the time of the August Report.

Table 5.F Calendar-year GDP growth rates of the modal, median and mean paths^(a)

	Mode	Median	Mean
2017 ^(b)	1.6 (1.7)	1.6 (1.7)	1.6 (1.7)
2018	1.6 (1.6)	1.6 (1.6)	1.6 (1.6)
2019	1.7 (1.8)	1.7 (1.7)	1.7 (1.7)
2020	1.7	1.7	1.7

(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 August 2017 Inflation Report. Projections were only available to 2019 at the time of the August 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 have implications for calendar-year growth in 2017. Without the anticipated revisions to past GDP growth, the modal path of the Committee's November projections would imply calendar-year growth of 1.5% in 2017 rather than 1.6%.

Chart 5.8 Projected probabilities of GDP growth in 2019 Q4 (central 90% of the distribution)^(a)

(a) Chart 5.8 represents the cross-section of the GDP growth fan chart in 2019 Q4 for the market interest rate projection. The grey outline represents the corresponding cross-section of the August 2017 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 5.8 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 ± 0.05 percentage points of any given growth rate, specified to one decimal place.

inflation is to return sustainably to the 2% target (Key Judgement 4). Conditioned on market interest rates, any remaining slack is judged likely to be used up by the end of the forecast period.

Key Judgement 4: significant upward pressure on inflation from import and energy prices eases over the forecast period and domestic inflationary pressures build

Inflation has risen to 3% and is projected to peak at around 3¼% in October. Inflation has been above the MPC's 2% target since the start of 2017, reflecting upward pressure from the depreciation of sterling and higher energy prices. The speed at which inflation returns to the 2% target will depend both on how quickly those upward pressures diminish and on the extent of domestic inflationary pressures.

The sterling ERI remains 18% below its late-2015 peak. That lower level of sterling has already led to a sharp rise in import prices, with somewhat more to come through over the forecast period (Chart 5.7). The rise in imported costs initially squeezes profit margins for companies in UK consumer supply chains (Section 4). That squeeze will unwind as companies pass on higher costs into their prices, but that process is likely to take several years to complete.

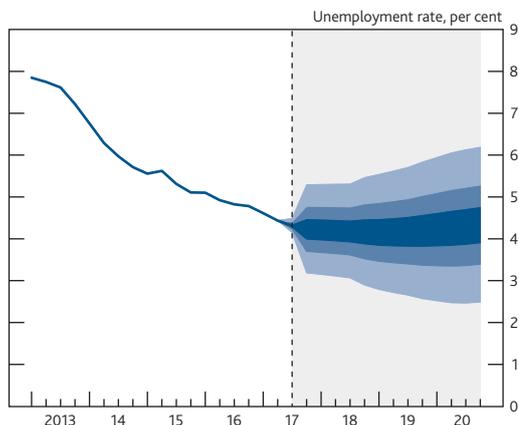
As companies have begun to pass on their higher costs, the contribution of import prices to CPI inflation has risen sharply, to nearly 1 percentage point. That contribution is expected to remain elevated in coming quarters before beginning to fall back in the second half of the forecast period. Below-average contributions from petrol and domestic energy prices are also projected to reduce inflation over the next 18 months or so.

The period of above-target inflation could be more persistent if it leads households and companies to revise up their expectations for inflation, and that feeds through to wage and price-setting decisions. Indicators of medium-term inflation expectations, however, remain consistent with the 2% target (Section 4).

The rise in external cost pressures has come against a backdrop of modest wage growth, even as the labour market has tightened. That in part reflects the low rate of productivity growth. The rise in productivity growth over the forecast period should feed through to higher pay growth, but both productivity and wage growth are likely to settle at lower rates than typically seen before the crisis.

There are some tentative signs of wage growth picking up, especially for new recruits (Section 4). With labour market churn back to pre-crisis levels, that should feed through into higher average pay growth over time. But there is still uncertainty about how responsive pay will be to an increasingly tight labour market. It is possible, for example, that pressure in the labour market at a time of above-target

Chart 5.9 Unemployment projection based on market interest rate expectations, other policy measures as announced



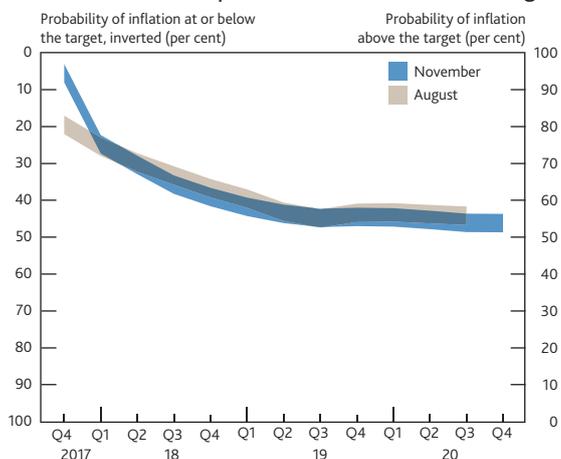
The fan chart depicts the probability of various outcomes for LFS unemployment. It has been conditioned on the assumptions in Table 5.A footnote (b). The coloured bands have the same interpretation as in Chart 5.1, and portray 90% of the probability distribution. The calibration of this fan chart takes 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 2017 Q3, a quarter earlier than the fan for CPI inflation. That is because Q3 is a staff projection for the unemployment rate, based in part on data for July and August. The unemployment rate was 4.3% in the three months to August, and is projected to be 4.3% in Q3 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.

Table 5.G Q4 CPI inflation

	Mode	Median	Mean
2017 Q4	3.0 (2.8)	3.0 (2.8)	3.0 (2.8)
2018 Q4	2.4 (2.5)	2.4 (2.5)	2.4 (2.5)
2019 Q4	2.2 (2.2)	2.2 (2.2)	2.2 (2.2)
2020 Q4	2.1	2.1	2.1

The table shows projections for Q4 four-quarter CPI inflation. The figures in parentheses show the corresponding projections in the August 2017 Inflation Report. Projections were only available to 2019 at the time of the August Report. The projections have been conditioned on the assumptions in Table 5.A footnote (b).

Chart 5.10 Inflation probabilities relative to the target



The November and August swaths 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 swaths reflects the fact that there is uncertainty about the precise probability in any given quarter, but they should not be interpreted as confidence intervals.

inflation feeds through to wage growth more quickly than assumed. In the other direction, uncertainty about the outlook for demand and profitability could weigh on companies' pay decisions or workers' willingness to search for a new role.

Inflationary pressure depends on changes in wages, and other labour costs such as pension contributions, relative to productivity. Developments in unit labour costs have been more consistent with a tightening labour market. Unit labour costs have been growing at close to past average rates, although that in part reflects a temporary boost from non-labour costs, which has begun to unwind (Section 4). As pressure on supply builds, unit labour cost growth is likely to pick up again.

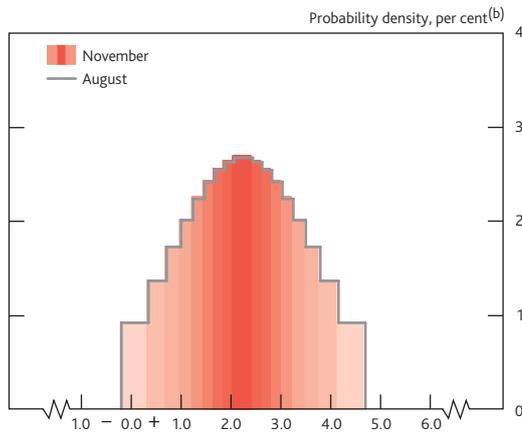
Conditional on market interest rate expectations, which anticipate two additional rises in Bank Rate over the three-year forecast period, the MPC judges that wage and unit labour cost growth are likely to rise over the forecast period (Tables 5.D and 5.C). In the central projection, CPI inflation is judged likely to still be slightly above the 2% target at the three-year forecast horizon.

5.2 The projections for demand, unemployment and inflation

Based on the judgements above and the risks around them, under the market path for Bank Rate and the assumption of an unchanged stock of purchased assets, the MPC projects four-quarter GDP growth to pick up from early next year and settle around 1¾%. In the second half of 2017, quarterly GDP growth is projected to be a little stronger than expected in August, but 2017 calendar-year growth is just below the August projection (Table 5.F) due to revisions to 2016 data. In the medium term, the projection is a touch weaker than in August (Chart 5.8), largely reflecting the rise in the yield curve since then. Within demand, consumption growth is projected to remain well below past average rates. But strong global growth, together with the lower level of sterling, supports net trade and investment. The risks around the central projection are judged to be balanced, rather than skewed to the downside as in August, reflecting a more balanced global outlook. That projection assumes that households and companies base their decisions on the expectation of a smooth adjustment to the United Kingdom's new trading relationship with the European Union.

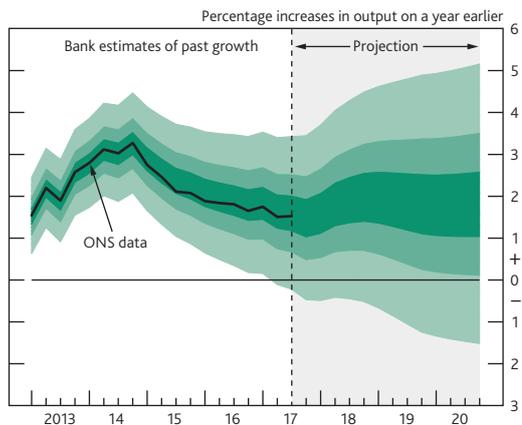
The economy's supply capacity is also projected to grow at a relatively modest pace over the forecast period. The MPC judges there to be a little less slack at the start of the forecast period than in August, and that is used up by the end. Unemployment is projected to remain around 42-year lows (Chart 5.9), lower than projected in August (Table 5.A).

Chart 5.11 Projected probabilities of CPI inflation in 2019 Q4 (central 90% of the distribution)^(a)



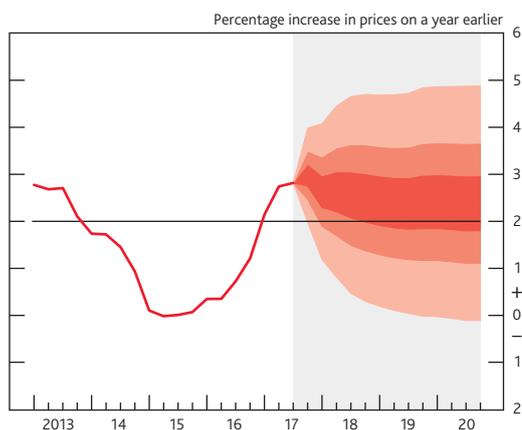
- (a) Chart 5.11 represents the cross-section of the CPI inflation fan chart in 2019 Q4 for the market interest rate projection. The grey outline represents the corresponding cross-section of the August 2017 *Inflation Report* fan chart for the market interest rate projection. The projections have been 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 ± 0.05 percentage points of any given inflation rate, specified to one decimal place.

Chart 5.12 GDP projection based on constant nominal interest rates at 0.5%, other policy measures as announced



See footnote to Chart 5.1.

Chart 5.13 CPI inflation projection based on constant nominal interest rates at 0.5%, other policy measures as announced



See footnote to Chart 5.2.

Inflation remains well above the MPC's 2% target and is projected to rise a little further in the near term, peaking around 3¼% in October. Above-target inflation reflects the impact of higher import prices following sterling's depreciation. Inflation is projected to fall back over 2018, largely reflecting a declining contribution from energy prices. Higher import prices are judged likely to take some time to work fully through to CPI inflation. Although their effect diminishes in the second half of the forecast period, they are still pushing inflation above the target at the three-year point. Domestic inflationary pressures build over the forecast period. CPI inflation is judged likely still to be slightly above the 2% target at the three-year forecast horizon (Table 5.G). The projection is a little lower than three months ago in the medium term (Chart 5.10), reflecting the higher yield curve. The risks around the inflation projection remain balanced (Chart 5.11).

Charts 5.12 and 5.13 show the MPC's projections under the alternative constant rate assumption and an unchanged stock of purchased assets. That assumption holds Bank Rate at 0.5% throughout the three years of the forecast period, before it rises towards the market path over the subsequent three years. Under that path, four-quarter GDP growth is projected to pick up a little more than in the market curve projection, slack to be eroded by the middle of the forecast period and demand to then rise notably above potential supply. Reflecting that greater pressure of demand on supply, inflation would end the forecast period around 2½%, further above the target than under the market path projection.

Other forecasters' expectations

This box reports the results of the Bank's most recent survey of external forecasters, carried out in October.⁽¹⁾ On average, respondents expected four-quarter GDP growth to slow a little further over the coming year, before picking up to just under 2% three years ahead (Table 1). Forecasters' central projections for the unemployment rate have, on average, continued to decline, and are now similar to or slightly below projections produced prior to the EU referendum (Chart A).

Table 1 Averages of other forecasters' central projections^(a)

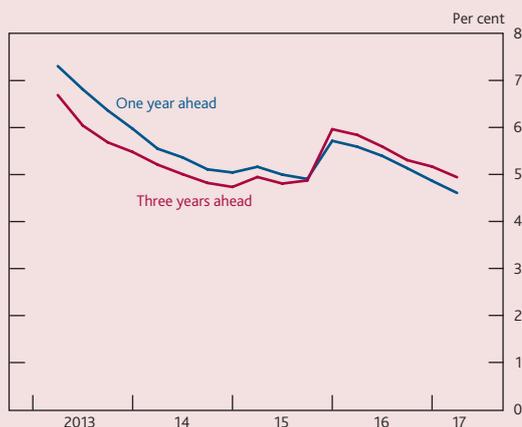
	2018 Q4	2019 Q4	2020 Q4
CPI inflation ^(b)	2.3	2.1	1.9
GDP growth ^(c)	1.4	1.5	1.8
LFS unemployment rate	4.6	4.7	4.9
Bank Rate (per cent)	0.7	0.9	1.1
Stock of purchased gilts (£ billions) ^(d)	440	440	442
Stock of purchased corporate bonds (£ billions) ^(d)	11	11	11
Sterling ERI	75.5	75.6	76.2

Source: Projections of outside forecasters as of 20 October 2017.

(a) For 2018 Q4, there were 17 forecasts for CPI inflation, 17 for GDP growth, 15 for the unemployment rate, 15 for Bank Rate, 12 for the stock of gilt purchases, 10 for the stock of corporate bond purchases and 7 for the sterling ERI. For 2019 Q4, there were 13 forecasts for CPI inflation, 13 for GDP growth, 12 for the unemployment rate, 14 for Bank Rate, 11 for the stock of gilt purchases, 9 for the stock of corporate bond purchases and 6 for the sterling ERI. For 2020 Q4, there were 12 forecasts for CPI inflation, 11 for GDP growth, 10 for the unemployment rate, 12 for Bank Rate, 9 for the stock of gilt purchases, 7 for the stock of corporate bond purchases and 6 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' unemployment projections have continued to decline

Forecasters' central projections of the unemployment rate

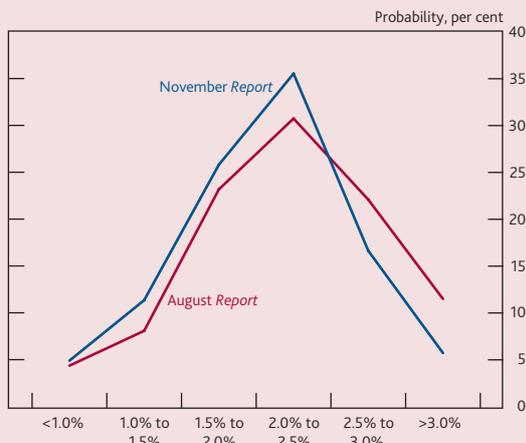


Sources: Projections of outside forecasters provided for *Inflation Reports* between November 2013 and November 2017.

External forecasters' central expectations for CPI inflation at all horizons were, on average, lower than three months ago (Table 1). And survey respondents, on average, put less weight on inflation being 0.5 percentage points or more above the target in two years' time than they had three months ago (Chart B).

Chart B The weight placed on inflation being above the target in two years' time has receded since August

Average of forecasters' probability distributions for CPI inflation in two years' time^(a)



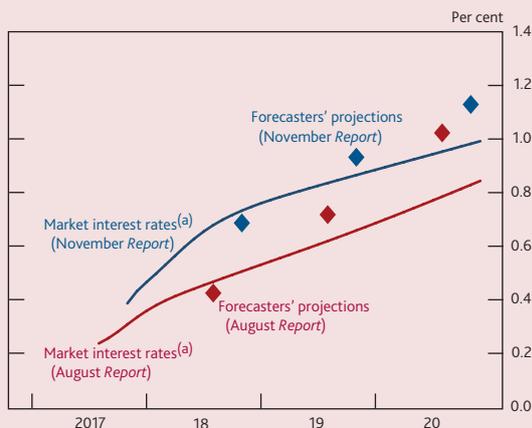
Sources: Projections of outside forecasters provided for *Inflation Reports* in August and November 2017.

(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.

External forecasters, on average, expected somewhat less monetary stimulus over the next three years than they did at the time of the *August Report*, broadly consistent with the steepening of the market-implied path for Bank Rate (Section 1 and Chart C). Respondents projected Bank Rate to rise to 0.9% in two years' time, compared with 0.7% in August. As in August, almost all forecasters expected the current stock of gilt and corporate bond purchases to remain unchanged over the next three years.

Chart C Expectations of Bank Rate are higher than in August

Market interest rates and forecasters' central projections of Bank Rate



Sources: Bloomberg, projections of outside forecasters provided for *Inflation Reports* in August and November 2017 and Bank calculations.

(a) Estimated using instantaneous forward overnight index swap rates in the fifteen working days to 26 July and 25 October.

(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/novofe.pdf.

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Glossary and other information

Glossary of selected data and instruments

AWE – average weekly earnings.

CPI – consumer prices index.

CPI inflation – inflation measured by the consumer prices index.

ERI – exchange rate index.

GDP – gross domestic product.

HICP – harmonised index of consumer prices.

LFS – Labour Force Survey.

PCE – personal consumption expenditure.

PPI – producer price index.

RPI – retail prices index.

RPI inflation – inflation measured by the retail prices index.

ULC – unit labour cost.

Abbreviations

BCC – British Chambers of Commerce.

CBI – Confederation of British Industry.

CEIC – CEIC Data Company Ltd.

CIPD – Chartered Institute of Personnel and Development.

CIPS – Chartered Institute of Purchasing and Supply.

EC – European Commission.

ECB – European Central Bank.

EME – emerging market economy.

EU – European Union.

FDI – foreign direct investment.

FOMC – Federal Open Market Committee.

FPC – Financial Policy Committee.

FTSE – Financial Times Stock Exchange.

G7 – Canada, France, Germany, Italy, Japan, the United Kingdom and the United States.

GfK – Gesellschaft für Konsumforschung, Great Britain Ltd.

GVA – gross value added.

HMRC – Her Majesty's Revenue and Customs.

IMF – International Monetary Fund.

LTV – loan to value.

MFIs – monetary financial institutions.

MPC – Monetary Policy Committee.

MSCI – Morgan Stanley Capital International Inc.

MTIC – missing trader intra-community.

NIIP – net international investment position.

OBR – Office for Budget Responsibility.

OECD – Organisation for Economic Co-operation and Development.

ONS – Office for National Statistics.

PCP – personal contract purchases.

PNFCs – private non-financial corporations.

PPP – purchasing power parity.

PRA – Prudential Regulation Authority.

PwC – PricewaterhouseCoopers.

R&D – research and development.

REC – Recruitment and Employment Confederation.

RICS – Royal Institution of Chartered Surveyors.

S&P – Standard & Poor's.

SMEs – small and medium-sized enterprises.

TFP – total factor productivity.

TFS – Term Funding Scheme.

VAT – Value Added Tax.

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.

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