

# Inflation Report

November 2015



BANK OF ENGLAND







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

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

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

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

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The *Inflation Report* is available in PDF alongside PowerPoint™ versions of the charts and Excel spreadsheets of the data underlying most of them at [www.bankofengland.co.uk/publications/Pages/inflationreport/2015/nov.aspx](http://www.bankofengland.co.uk/publications/Pages/inflationreport/2015/nov.aspx).



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# Monetary Policy Summary

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The Bank of England's Monetary Policy Committee (MPC) sets monetary policy in order to meet the 2% inflation target and in a way that helps to sustain growth and employment. At its meeting ending on 4 November 2015, the MPC voted by a majority of 8–1 to maintain Bank Rate at 0.5%. The Committee voted unanimously to maintain the stock of purchased assets financed by the issuance of central bank reserves at £375 billion, and so to reinvest the £6.3 billion of cash flows associated with the redemption of the December 2015 gilt held in the Asset Purchase Facility.

In September, twelve-month CPI inflation stood at -0.1%, slightly over 2 percentage points below the inflation target. Around four fifths of the deviation from the target reflects falls in energy, food and other imported goods prices, with the remainder reflecting subdued domestic cost growth. The combined weakness in domestic costs and imported goods prices is evident in subdued measures of core inflation, which are currently around 1%.

The outlook for inflation reflects the balance between persistent drags from factors such as sterling and world export prices, and prospective further increases in domestic cost growth. The MPC's objective is to return inflation to target sustainably; that is, without an overshoot once persistent disinflationary forces ultimately wane. Given these considerations, the MPC intends to set monetary policy to ensure that growth is sufficient to absorb remaining spare capacity in a manner that returns inflation to the target in around two years and keeps it there in the absence of further shocks.

The outlook for global growth has weakened since the August *Inflation Report*. Many emerging market economies have slowed markedly and the Committee has downgraded its assessment of their medium-term growth prospects. While growth in advanced economies has continued and broadened, the Committee nonetheless expects the overall pace of UK-weighted global growth to be more modest than had been expected in August. There remain downside risks to this outlook, including that of a more abrupt slowdown in emerging economies.

Domestic momentum remains resilient. Consumer confidence is firm, real income growth this year is expected to be the strongest since the crisis, and investment intentions remain robust. As a result, domestic demand growth has been solid despite the fiscal consolidation. Although it has moderated, growth is projected to pick up a little towards the middle of next year, as a tighter labour market and stronger productivity support real incomes and consumption, and as accommodative credit conditions encourage strong investment and a pickup in the housing market. The Committee judges the risks to domestic demand to be broadly balanced.

Robust private domestic demand is expected to produce sufficient momentum to eliminate the margin of spare capacity over the next year. Domestic cost pressures are expected to build as a result of a pickup in wage growth relative to productivity growth. CPI inflation is nonetheless expected to remain below 1% until the second half of next year, reflecting the continuing drag from commodity and other imported goods prices. Beyond that, the dampening influence of sterling's past appreciation on inflation is expected to be persistent, diminishing only slowly over the MPC's forecast period. In this context, the MPC judges it appropriate to return inflation to the target in around two years.

Reflecting concerns about the global outlook, prices of risky assets have fallen since August. There have also been sizable declines in the yields on safe assets. These have had opposing effects in the forecast. The path for Bank Rate implied by market yields, on which the MPC's projections are conditioned, has fallen and now embodies an even more gradual pace of tightening than at the time of the previous *Report*.

In the Committee's judgement, the lower path for Bank Rate implied by market yields would provide more than adequate support to domestic demand to bring inflation to target even in the face of global weakness. In that case, the MPC's best collective judgement is for the most likely path for inflation to exceed slightly the 2% target in two years and then rise a little further above it, reflecting modest excess demand. The MPC judges that the risks to this projection lie slightly to the downside in the first two years, reflecting global factors.

Underlying those projections are significant judgements in a number of areas, as described in the November *Inflation Report*. In any one of these areas, developments might easily turn out differently than assumed, with implications for the outlook for growth and inflation, and therefore for the appropriate stance of monetary policy. Reflecting that, there is a range of views among MPC members about the balance of risks to inflation relative to the best collective judgement presented in the November *Report*. At the Committee's meeting ending on 4 November, the majority of MPC members judged it appropriate to leave the stance of monetary policy unchanged at present. Ian McCafferty preferred to increase Bank Rate by 25 basis points, given his view that the path of domestic costs was more likely to lead to inflation exceeding the target in the medium term than was embodied in the Committee's collective November projections.

All members agree that, given the likely persistence of the headwinds weighing on the economy, when Bank Rate does begin to rise, it is expected to do so more gradually and to a lower level than in recent cycles. This guidance is an expectation, not a promise. The actual path Bank Rate will follow over the next few years will depend on the economic circumstances.



# 1 Global economic and financial developments

UK-weighted world GDP rose at a slightly slower pace in 2015 Q2 than projected in the *August Report*. The near-term outlook is also weaker than in August, reflecting developments in emerging economies. In part reflecting that weaker outlook, global equity prices are lower and oil prices have fallen by 14% since the *August Report*. In the United Kingdom, market prices imply a more gradual pace of Bank Rate rises than in August. The sterling ERI is around 2% lower.

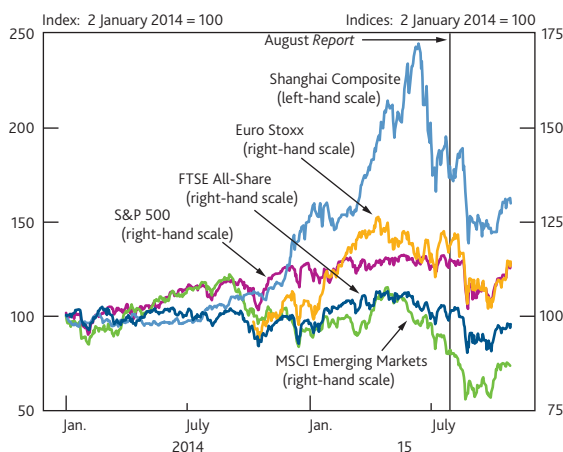
**Table 1.A** Monitoring the MPC's key judgements

Developments anticipated in August	Developments since August
<b>Advanced economies</b>	<b>Broadly on track</b>
<ul style="list-style-type: none"> <li>Quarterly euro-area growth to average around ½%. Inflation expected to begin to pick up towards the end of the year.</li> <li>Average quarterly US GDP growth of a little below ¾%; non-farm payrolls to increase by around 250,000 a month.</li> </ul>	<ul style="list-style-type: none"> <li>GDP rose by 0.4% in Q2. Inflation was zero in October, but is expected to pick up in coming months.</li> <li>GDP rose by 0.4% in Q3, following upwardly revised growth of 1% in Q2. Non-farm payrolls rose by a monthly average of 167,000 in Q3.</li> </ul>
<b>Rest of the world</b>	<b>Emerging-economy growth weaker</b>
<ul style="list-style-type: none"> <li>Average four-quarter PPP-weighted emerging-economy growth of around 4¼% on average; Chinese GDP growth to average around 6½%.</li> </ul>	<ul style="list-style-type: none"> <li>Emerging-economy GDP growth was 4.0% in Q2. Chinese GDP growth was 6.9% in Q3.</li> </ul>
<b>Commodity prices and the exchange rate</b>	<b>Oil prices much lower; sterling lower</b>
<ul style="list-style-type: none"> <li>Commodity prices and sterling ERI to evolve in line with the conditioning assumptions.</li> </ul>	<ul style="list-style-type: none"> <li>US dollar oil prices are around 14% lower. Sterling depreciated by around 2%.</li> </ul>

There have been sharp moves in financial markets since the *August Report*. Global equity prices fell materially and financial market volatility rose in August and September, although these trends reversed somewhat in October (**Chart 1.1**). UK short-term interest rates were lower in the run-up to the *November Report* than three months ago, although some of the falls were subsequently unwound. These developments may reflect market participants' views about the prospects for, and potential downside risks to, global growth. Since the *August Report*, activity in advanced economies has been broadly on track (**Table 1.A**), but emerging-economy growth has persistently disappointed over recent years. Recent developments in China have highlighted the challenges faced by the authorities of liberalising and rebalancing the economy. As set out in the box on page 2, a sharp slowing in China could affect the UK economy through a number of channels, including through trade and financial interlinkages.

## 1.1 Global economic developments

**Chart 1.1** Global equity prices are lower than in the run-up to the *August Report*  
International equity prices<sup>(a)</sup>



Sources: Thomson Reuters Datastream and Bank calculations.

(a) In local currency terms, except for MSCI Emerging Markets, which is in US dollar terms.

UK-weighted world GDP growth was 0.5% in 2015 Q2, slightly weaker than expected in August, and below its average rate. It is likely to have continued at a similar pace in Q3. The picture across regions was mixed. Euro-area growth was broadly as expected in Q2; in contrast, growth was weaker than expected in a number of other economies (**Table 1.A**), including Brazil and Russia. Growth in the United States exceeded expectations in Q2, before falling back in Q3.

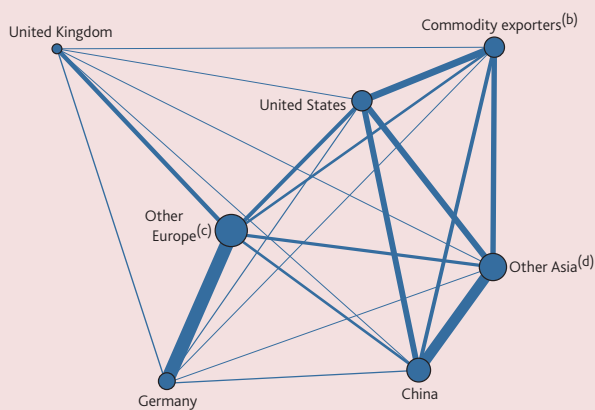
World GDP growth has been persistently weaker than expected over the past few years. Much of that weakness has been concentrated in emerging economies, where growth has slowed more sharply than anticipated. For example, annual emerging-economy growth since 2012 has been, on average, ¾ of a percentage point lower than International Monetary Fund (IMF) forecasts made the previous year (**Chart 1.2**). Those repeated undershoots have led the MPC to make a downward reappraisal of the medium-term growth rate for these economies relative to the assumption in previous

## How would a slowdown in China affect the UK economy?

Chinese growth has slowed significantly in recent years, from annual rates of around 10% before the crisis, to around 7% currently. Growth is projected to continue to moderate over the MPC's forecast period, as demand rebalances towards consumption, although there is significant uncertainty about how smooth that rebalancing will be and a risk that growth slows more sharply (Section 5). This box sets out the channels through which a sharp slowdown in China would affect the United Kingdom, along with some estimates of their size.

China plays a significant role in the global economy. It is now the second largest economy, accounting for 13% of global GDP in 2014, compared with less than 2% in 1990.<sup>(1)</sup> Over that time, China's trade and financial links with the rest of the world have multiplied. China is the world's largest goods exporter, and Chinese demand accounts for around 10% of global trade (Chart A). In commodity markets, China has accounted for just over a third of oil demand growth in recent years and the majority of demand growth for copper. Although China's financial system is relatively closed, its linkages with the global financial system have increased. China's external liabilities accounted for 6% of world GDP in 2014, compared with an average of 3% during 2005–12.

**Chart A China's trade links are significant**  
International trade flows<sup>(a)</sup>



Sources: IMF Direction of Trade Statistics, Thomson Reuters Datastream and Bank calculations.

- (a) The size of the circle illustrates each country's or region's relative export share in global goods trade. The thickness of the line indicates the size of total goods trade between countries (or regions). Both the circles and the lines are based on nominal trade data, in US dollars, for 2014.  
 (b) Non-Asian commodity exporters, including Argentina, Australia, Brazil, Canada, Chile, Norway, Peru, Saudi Arabia and South Africa.  
 (c) Includes Austria, Belgium, Finland, France, Italy, the Netherlands, Spain, Sweden and Switzerland.  
 (d) Includes India, Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore and Thailand.

China accounts for only 3% of UK exports so any direct effects of a slowdown on UK output are likely to be relatively small. But a slowing in China would also indirectly reduce UK export demand by weighing on activity in other trading partners. For example, China is an important source of demand for Germany and other European countries, which account for close to 40% of UK exports (Chart A).

As China is also an important source of demand for commodities, a slowdown there would probably be associated with commodity price falls. These falls would, overall, support activity in the United Kingdom and other commodity importers by boosting households' real incomes.

A sharper-than-anticipated slowdown in China could also be reflected in falls in asset prices in China and elsewhere. Such falls may push up UK companies' cost of capital and reduce households' wealth. A sharp slowing in China could also raise uncertainty about the outlook for growth there and elsewhere, which may weigh on UK households' and companies' spending decisions. The size of these channels is likely to depend on the scale and the nature of the slowing in China: a more severe slowdown could have a significantly greater impact on risk sentiment and uncertainty.

A sharp slowing in China could also have an impact on the UK banking sector. UK-owned banks with exposures to China could suffer losses, which in turn, might bear down on their ability to lend to the UK real economy. They could also lead to an increase in banks' funding costs, particularly if combined with a deterioration in financial market sentiment, which would increase the cost of borrowing for UK businesses and households. The capacity of the UK banking system to maintain lending should these risks materialise will be assessed as part of the Bank of England's 2015 stress test.

Estimates based on a model of the global economy that captures trade, financial and commodity price linkages suggest that, if Chinese GDP were to fall by 3% relative to its trend, UK output would be 0.3% lower as a result (Table 1). Although that model captures China's current importance in world trade, other channels are based on historical correlations. So, given the growth in China's interlinkages with the global economy, these estimates may understate the impact of a slowdown in China. Indeed, in recent months global asset prices have been noticeably sensitive to developments in China (Section 1.2).

**Table 1 A slowing in China would weigh on the UK economy**  
Impact of a 3% fall in Chinese GDP on UK GDP<sup>(a)</sup>

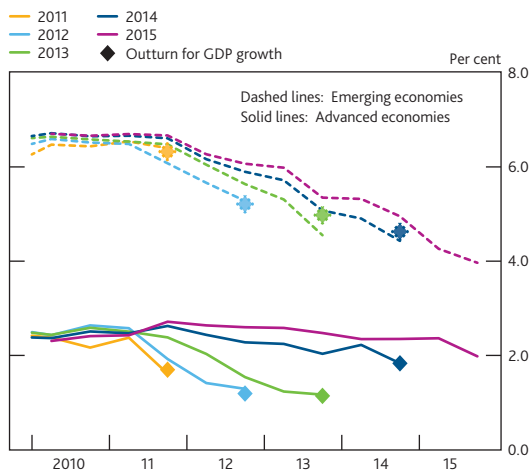
	Impact on UK GDP (per cent)
Model estimate	-0.3
<b>Bottom-up estimate of channels</b>	
Trade channel	-0.3
of which, direct trade	-0.1
Commodity prices	+0.1
Implied impact of non-trade channels	-0.1

(a) Shows the estimated impact on UK GDP of an unanticipated shock that leaves Chinese GDP 3% below its long-run trend after five years.

(1) Based on comparisons of countries' GDP using market exchange rates.

### Chart 1.2 Emerging-economy growth has slowed by more than expected in recent years

Outturns and IMF forecasts for calendar-year GDP growth in emerging and advanced economies<sup>(a)</sup>

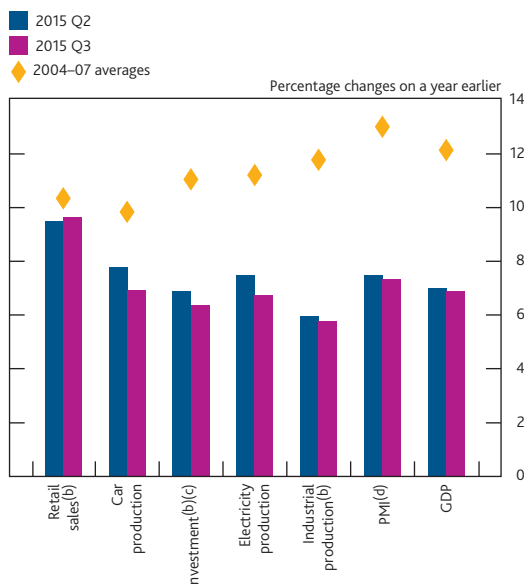


Source: IMF World Economic Outlook (WEO).

(a) Shows growth outturns and projections for advanced economies and emerging market and developing economies, as grouped by the IMF. Each line shows how forecasts for a particular calendar year have evolved over time. The diamond shows the eventual outturn, as published in the October 2015 WEO.

### Chart 1.3 Slowing GDP growth in China has been associated with slowing industrial activity

Chinese activity indicators<sup>(a)</sup>



Sources: CEIC, Chinese National Bureau of Statistics, Thomson Reuters Datastream and Bank calculations.

(a) Annual growth in activity indicators has been scaled so that they have the same mean and variance as annual GDP growth over the period 1998 Q2 to 2015 Q3, except for car production, which is scaled to the period 2001 Q1 to 2015 Q3, and the PMI, which is scaled to the period 2007 Q1 to 2015 Q3.

(b) Deflated using the consumer price index.

(c) Data are for fixed asset investment.

(d) National Bureau of Statistics headline PMI data. Manufacturing and non-manufacturing indices are weighted together using weights in gross value added. The diamond shows the average for 2007.

*Reports* (Section 5). While growth in advanced economies, which account for around three quarters of UK exports, appears to have been broadly stable since 2014, it has also persistently disappointed expectations (Chart 1.2). Overall, UK-weighted world GDP growth is projected to rise modestly in the near term, but at a more gradual pace than expected in August. In addition, recent events have highlighted the risk that growth in emerging economies, particularly in China, could slow more sharply than expected.

### China

Chinese growth has slowed significantly in recent years (Table 1.B). That has been associated with a moderation in indicators of growth in industrial activity and investment; in contrast, growth in retail sales, an indicator of household consumption, remains robust (Chart 1.3). Such relative growth rates are consistent with some rebalancing of demand towards consumption and output towards the service sector. Concerns around the outlook for demand as the economy continues to rebalance may have been one driver of the falls in equity prices during the summer (Chart 1.1). These concerns have also been associated with a range of policy easing measures over the past year. Easier policy is likely to have supported growth, with a number of indicators pointing to relatively stable activity in recent quarters (Chart 1.3). The official estimate of annual GDP growth was 6.9% in 2015 Q3, similar to rates seen in the first half of the year (Table 1.B), and broadly as anticipated in August. Since the *August Report*, authorities have loosened both monetary and fiscal policy further.

The authorities have also undertaken measures towards financial liberalisation. In early August, the People's Bank of China lowered the renminbi's central parity with the US dollar and changed the mechanism for determining the central parity: it is now based on the previous day's closing exchange rate and therefore better reflects short-term movements in demand and supply. In late August, some measures previously introduced to support the equity market were withdrawn. At the end of October, the cap on customer deposit rates was removed. These developments were associated with a rise in financial market volatility in August and September as equity prices fell further (Chart 1.1), and the renminbi depreciated by 3% against the US dollar, before recovering somewhat (Chart 1.4). That depreciation took place against a backdrop of significant outflows of private capital, which required the authorities to sell foreign reserves to support the exchange rate: official reserves are reported to have fallen by around US\$300 billion — around 9% — since the start of the year.

As in August, Chinese growth is projected to continue to moderate gently in the near term. But recent financial market developments have highlighted the challenges faced by the authorities in maintaining growth while both liberalising and rebalancing the Chinese economy. As set out in the box on page 2, a sharp slowing in China could affect the UK economy

**Table 1.B Mixed pattern of GDP growth in Q2**  
GDP in selected countries and regions<sup>(a)</sup>

	Averages			2015		
	1998–2007	2012–13	2014	Q1	Q2	Q3
	United Kingdom	2.9	1.9	3.0	1.5	2.6
Euro area (39%)	2.3	-0.2	0.9	2.1	1.4	n.a.
United States (18%)	3.0	1.9	2.5	0.6	3.9	1.5
China (3%) <sup>(b)</sup>	10.5	7.7	7.3	7.0	7.0	6.9
Japan (2%)	1.1	1.2	-0.7	4.5	-1.2	n.a.
India (2%) <sup>(b)</sup>	n.a.	5.9	7.1	7.5	7.0	n.a.
Russia (1%) <sup>(c)</sup>	7.8	1.6	-0.5	-6.1	-7.8	n.a.
Brazil (1%)	3.1	2.2	-0.3	-2.9	-7.2	n.a.
UK-weighted world GDP <sup>(d)</sup>	3.0	1.6	2.1	2.1	2.0	n.a.

Sources: IMF WEO October 2015, OECD, Thomson Reuters Datastream and Bank calculations.

(a) Real GDP measures. Figures in parentheses are shares in UK goods and services exports in 2013 from the 2014 *Pink Book*.

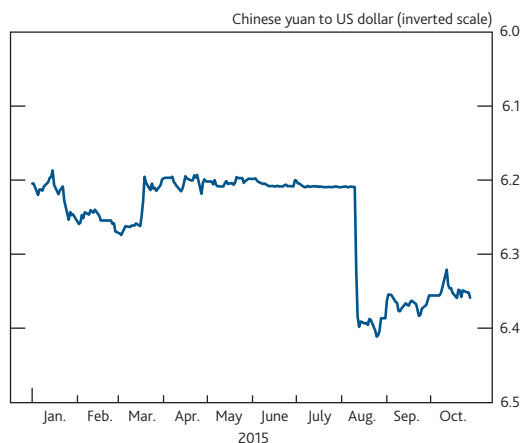
(b) Data are four-quarter growth. The earliest observation for China is 2000 Q1 and for India is 2012 Q2.

(c) The earliest observation for Russia is 2003 Q1.

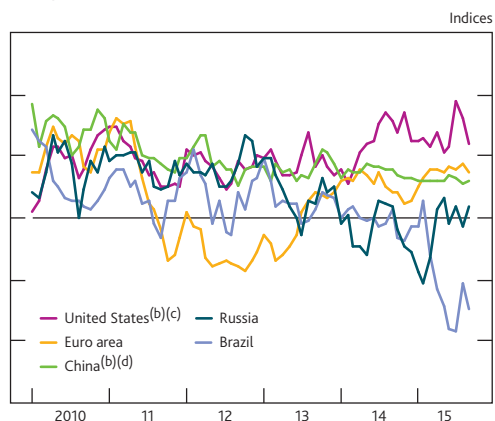
(d) Constructed using data for real GDP growth rates of 146 countries weighted according to their shares in UK exports. For the vast majority of countries, the latest observation is 2015 Q2. For those countries where data for 2015 Q2 are not yet available, data are assumed to be consistent with projections in the IMF WEO October 2015.

**Chart 1.4 The renminbi depreciated against the US dollar in early August**

Renminbi-US dollar exchange rate



**Chart 1.5 PMIs in Russia and Brazil remained weak in Q3**  
Composite PMIs in selected countries<sup>(a)</sup>



Sources: Chinese National Bureau of Statistics, Markit Economics and Thomson Reuters Datastream.

(a) Shows composite output indices unless otherwise stated. A reading of above 50 indicates increasing output and a reading below 50 indicates decreasing output. Data are to September 2015.

(b) Manufacturing and non-manufacturing indices are weighted together using shares in nominal value added.

(c) Non-manufacturing indices are non seasonally adjusted.

(d) Shows the National Bureau of Statistics headline index.

through a number of channels, including through trade and financial interlinkages.

### Other emerging economies

Growth across emerging economies has moderated in recent years (Chart 1.2), and was again weaker than expected in 2015 Q2 (Table 1.A). Although GDP continued to rise solidly in India, output contracted markedly in Brazil and Russia (Table 1.B), and PMI indices suggest that output remained weak in Q3 (Chart 1.5). Equity prices have also fallen in a number of emerging economies (Section 1.2).

The recent falls in asset prices and associated rises in the cost of capital are likely to weigh on the emerging-economy growth outlook somewhat, compared with the *August Report*. Further falls in oil prices will also weigh on activity in commodity producers, although they are likely to support activity in commodity-importing economies. As discussed in August, there remains a risk that a tightening in US monetary policy (Section 1.3) could exert an additional drag on activity in emerging economies if it is associated with increased capital outflows and further falls in asset prices. Furthermore, an increase in US dollar interest rates could increase the costs of servicing dollar-denominated debt, which has become more prevalent in emerging economies in recent years.<sup>(1)</sup>

### Euro area

After stagnating in 2012 and 2013, the euro-area economy has begun to recover. GDP rose by 0.4% in 2015 Q2, as projected in the *August Report*. Investment fell on the quarter, following robust growth in Q1. GDP growth was supported by a pickup in export growth and rises in household spending, which in turn may have been boosted by falls in energy prices. Monthly indicators, such as the PMI output surveys, point to a similar pace of expansion in Q3, with little evidence of a drag from uncertainty around Greek debt negotiations during the summer. Moreover, the immediate risks in relation to Greece have receded following the outline deal reached by the Greek government and its euro-area creditors.

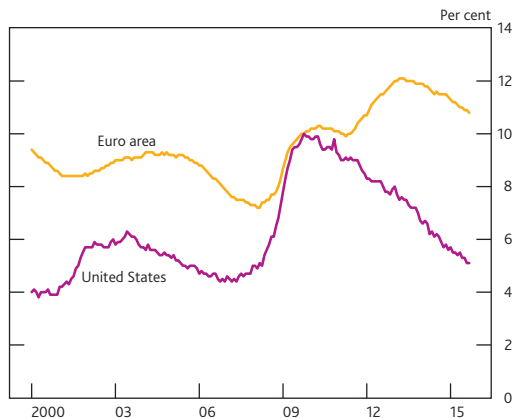
Inflation remains very low: according to the flash estimate, HICP inflation was zero in October. That is due mostly to steep falls in energy prices, but also reflects spare capacity: although now on a declining path, the unemployment rate is well above its pre-crisis average (Chart 1.6). Inflation is expected to pick up in coming months as energy price falls begin to drop out of the annual rate, and is likely to rise further as demand continues to grow and the degree of slack narrows.

As in August, euro-area activity is projected to be supported by the falls in energy prices, improved credit conditions, European Central Bank (ECB) asset purchases and the past depreciation in the euro (Section 5). Since the *August Report*, however, financial conditions have deteriorated somewhat, reflecting

(1) For further discussion see page 14 of the July 2015 *Financial Stability Report*; [www.bankofengland.co.uk/publications/Documents/fsr/2015/fsrfull1507.pdf](http://www.bankofengland.co.uk/publications/Documents/fsr/2015/fsrfull1507.pdf).

**Chart 1.6 US unemployment rate close to pre-crisis rates; euro-area rate remains elevated**

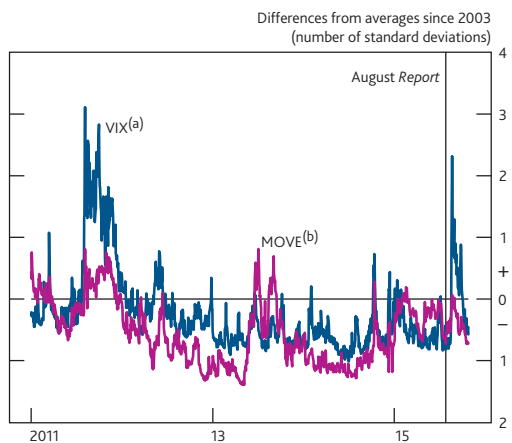
Euro-area and US unemployment rates



Sources: Eurostat and US Bureau of Labor Statistics.

**Chart 1.7 Equity price implied volatility picked up in August before falling back**

Implied volatilities for equity prices and interest rates in the United States

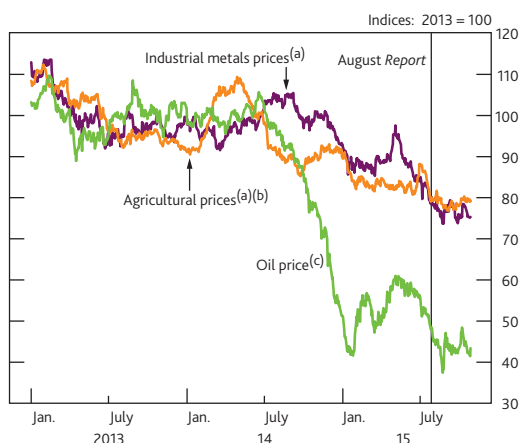


Source: Bloomberg.

(a) VIX measure of 30-day implied volatility of the S&P 500 equity index.  
(b) Merrill Option Volatility Estimate (MOVE) index, a yield curve weighted index of the normalised implied volatility on one-month Treasury options.

**Chart 1.8 Commodity prices are lower than in the run-up to 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 GSCI commodity index.  
(c) US dollar Brent forward prices for delivery in 10–25 days' time.

market concerns about growth prospects for emerging economies, and the euro effective exchange rate (ERI) has appreciated slightly (Section 1.2). These are expected to weigh somewhat on the near-term outlook, but are likely to be partly offset by the impact of further falls in energy prices. There is a risk, however, that a sharper-than-anticipated slowdown in emerging economies could weigh on euro-area activity.

### United States

In the United States, GDP rose by 0.4% in 2015 Q3. That was below the upwardly revised rate of 1% in Q2, which is likely to have reflected an unwinding of erratic factors that had depressed growth in Q1 (Table 1.B). Growth in Q3 was accounted for by a solid contribution from final domestic demand. That was partly offset by a drag from stockbuilding. Export growth weakened, reflecting subdued external demand and the 13% rise in the dollar over the past year.

In the near term, GDP growth is expected to remain below pre-crisis average rates. Export growth is likely to remain weak. In contrast, domestic demand growth is expected to remain supported by improvements in credit conditions and the boost to real incomes from falls in energy prices. Largely reflecting energy price falls, annual personal consumption expenditure inflation was only 0.2% in September.

Inflation is expected to rise in the near term, as past energy price falls start to drop out of the annual comparison. Further out, the pickup in inflation will rely on a more pronounced recovery in wage growth. There has only been a small rise in wage growth so far, despite falls in unemployment in recent years (Chart 1.6). The unemployment rate continued to fall during Q3: at 5.1% in September, it lies close to the Federal Open Market Committee's (FOMC's) median projection of 4.9% for the longer-term unemployment rate. But employment growth was somewhat weaker than had been expected in August (Table 1.A).

## 1.2 Asset prices and monetary policy

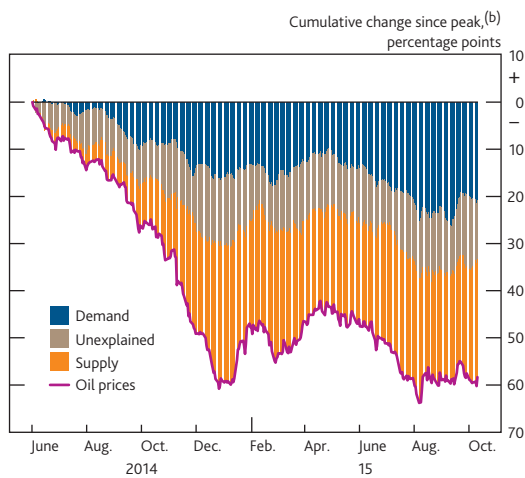
Concerns about the prospects for growth in emerging economies, and their potential spillovers to advanced economies, were associated with sharp moves in financial markets in August and September, some of which have since unwound. Commodity and equity prices fell significantly and measures of uncertainty rose (Chart 1.7), before recovering somewhat in October. Short-term and long-term interest rates in the United Kingdom have fallen since the August Report, alongside those in the United States and the euro area.

### Commodity prices

The Brent crude spot oil price has fallen by 14% since the August Report to US\$48, and is nearly 60% below its June 2014 peak (Chart 1.8). The falls over the past year have taken place against the backdrop of a number of supply and demand developments, which will have borne down on prices. On the path implied by

**Chart 1.9 Both supply and demand factors have weighed on oil prices over the past year**

Asset price based decomposition of oil prices<sup>(a)</sup>



Sources: Thomson Reuters Datastream and Bank calculations.

(a) Decomposition is constructed using partial least squares analysis of movements in over 200 international asset prices.

(b) Change in US dollar Brent crude oil prices since 19 June 2014.

the futures curve, on which the MPC's forecast is conditioned, the oil price reaches US\$62 in three years' time.

The implications of recent falls in oil prices for UK activity will depend on the extent to which they reflect stronger supply or weaker demand.<sup>(1)</sup> For example, if the fall in oil prices stems from a weakening in world, and hence oil, demand, then the overall impact will reflect both the weaker world outlook, as well as a boost from the lower oil price. In contrast, the implications for UK growth of a supply-driven decline in oil prices would be more positive. One way of ascertaining the relative importance of demand and supply factors is to assess comovements across a range of asset prices, which should respond differently to oil supply and demand shocks. Estimates using such an approach suggest around two thirds of the fall in oil prices over the past six months can be accounted for by demand-related factors (**Chart 1.9**), such as concerns about weaker growth in countries such as China. Consistent with those concerns, metals and agricultural commodity prices were also lower than at the time of the *August Report* (**Chart 1.8**).

Supply factors, however, are estimated to have been a more significant driver of the overall fall in oil prices since mid-2014 (**Chart 1.9**). As set out in previous *Reports*, supply expectations have risen over the past year: US and OPEC production have been greater than expected, and the anticipated lifting of the trade embargo on Iran has boosted expected oil supply.

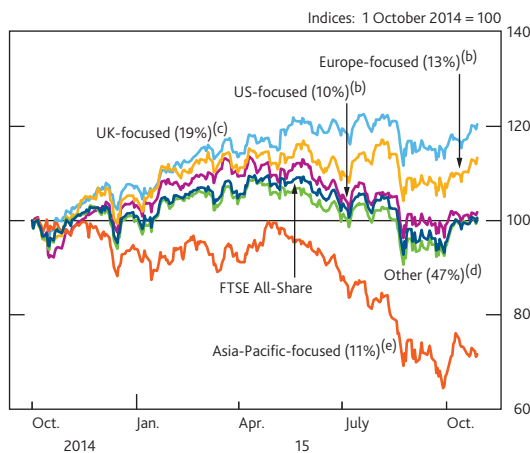
### Corporate capital markets

Global equity prices fell significantly in August, before recovering somewhat in October (**Chart 1.1**). Overall, UK and US equity prices were around 4% and 3% lower respectively than in the run-up to the *August Report*, and euro-area equity prices were 7% lower. Equity prices in emerging economies also fell, with a decline of 14% in China (Section 1.1), and falls of around 7% and 3% in Brazil and India respectively. These concurrent falls may reflect increased concerns about the global outlook among market participants. Consistent with that, implied volatility — a gauge of financial market uncertainty — rose to above-average levels in August and September before falling back in October (**Chart 1.7** shows that for the United States). Reflecting the combination of the falls in equity prices and government interest rates, equity risk premia — the compensation for taking equity risk demanded by investors — are estimated to have risen in the United Kingdom, United States and the euro area, before falling back a little in October.

Despite recent falls, UK equity prices are little changed over the past year (**Chart 1.1**). But that masks a significant divergence between the equity prices of companies with large exposures to countries in the Asia-Pacific region, including China, which have

**Chart 1.10 UK-focused companies' equity prices have been relatively resilient**

Constituents of the FTSE All-Share by geographical focus<sup>(a)</sup>



Sources: Thomson Reuters Datastream and Bank calculations.

(a) Companies are categorised using annual financial accounts data on their geographic revenue breakdown. The share of market capitalisation of each category is shown in parentheses.

(b) Companies that generate 40% or more of their revenues in the United States or Europe.

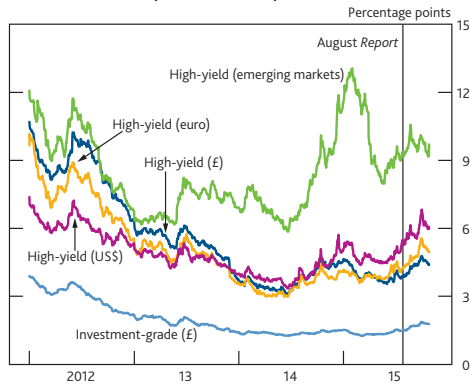
(c) Companies that generate at least 70% of their revenues in the United Kingdom.

(d) Companies that have not been assigned a primary geographic revenue source.

(e) Companies that generate 30% or more of their revenues in the Asia-Pacific region.

(1) For a discussion of the impact of lower oil prices on the UK economy, see the box on pages 32–33 of the *February 2015 Report*; [www.bankofengland.co.uk/publications/Documents/inflationreport/2015/feb.pdf](http://www.bankofengland.co.uk/publications/Documents/inflationreport/2015/feb.pdf).

**Chart 1.11 Corporate bond spreads have widened**  
International corporate bond spreads<sup>(a)</sup>



Source: BofA Merrill Lynch Global Research.

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

**Chart 1.12 Some bank funding spreads have risen**  
slightly over the past three months

UK banks' indicative long-term funding spreads

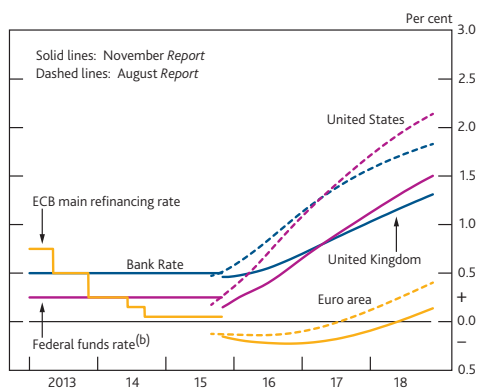


Sources: Bank of England, Bloomberg, Markit Group Limited and Bank calculations.

(a) Constant-maturity unweighted average of secondary market spreads to mid-swaps for the major UK lenders' five-year euro senior unsecured bonds or a suitable proxy when unavailable.  
(b) 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. Bond rates data for October are flash estimates.  
(c) Unweighted average of the five-year senior CDS premia for the major UK lenders.  
(d) Constant-maturity unweighted average of secondary market spreads to swaps for the major UK lenders' five-year euro-denominated covered bonds or a suitable proxy.

**Chart 1.13 Market prices imply lower interest rates in**  
three years' time than they did in August

International forward interest rates<sup>(a)</sup>



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

(a) The November 2015 and August 2015 curves are estimated using instantaneous forward overnight index swap rates in the fifteen working days to 28 October and 29 July respectively.

(b) Upper bound of the target range of 0% to 0.25%.

fallen sharply since the spring, and those of predominantly UK-focused companies, which have been more stable (Chart 1.10). That could suggest that market participants' views of the domestic outlook have remained relatively solid.

Prices of other risky assets — such as high-yield non-financial corporate bonds — have also fallen since August and their yields have risen. That reflects a widening in spreads — the additional compensation that investors require for holding risky corporate bonds instead of safer government bonds (Chart 1.11). Some of that rise, particularly in the United States, has been concentrated in energy sector companies. But spreads in other sectors have also risen, which could reflect a broader weakening in sentiment.

In the United Kingdom, the interest rates at which banks can raise wholesale funds were little changed in the run-up to the November Report, compared with three months earlier, and significantly lower than levels seen in 2011–12. While government bond and other reference rates have fallen since August, that was offset by a small widening in the spreads banks pay on reference rates (Chart 1.12). As noted in the Q3 *Credit Conditions Review*, major UK lenders attributed the widening in spreads in recent quarters to international developments and the associated volatility in financial markets.

Lenders reported in the Q3 *Bank Liabilities Survey* that widening funding spreads had led to increases in their transfer prices, or the internal prices charged to business units within each bank to fund the flow of new loans. By itself, this increase should lead to higher interest rates on new loans to households and companies. But competition in the banking sector appears to have increased over the past year or so and is likely to weigh on lending rates, partly offsetting the impact of higher transfer prices. Overall, lending rates remain close to historical lows (Section 2).

### Monetary policy and interest rates

Short-term interest rates in the United Kingdom, United States and euro area were lower in the run-up to the November Report than three months earlier (Chart 1.13). While some of those falls may reflect lower expectations of the most likely path for policy, given the weaker outlook for global growth and inflation, some could also reflect increased perceptions of downside risks. Some of the falls in UK and US rates were partly reversed at the end of October, after the MPC's forecast was finalised (Section 5).

In the United States, the FOMC kept the federal funds rate unchanged. In the fifteen working days to 28 October, the market-implied path for US interest rates reached 1.5% in 2018 Q4, compared with 2.1% at the time of the August Report (Chart 1.13). That lower path reflected market reaction to the FOMC's policy statement in September, as well as weaker-than-expected domestic data. Some of that move

was unwound following the FOMC's October policy meeting on 28 October.

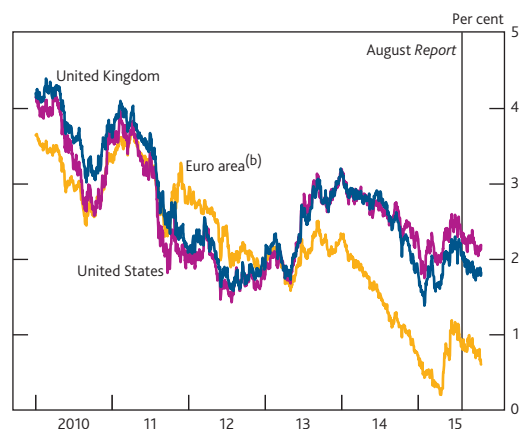
In the United Kingdom, in the fifteen working days to 28 October the market-implied path for Bank Rate reached 1.3% in 2018 Q4, compared with 1.8% at the time of the *August Report* (Chart 1.13). That flattening took place against the backdrop of rises in financial market volatility in August and international developments. The box on page 9 discusses the factors behind the MPC's decisions in September and October, while the factors underpinning the Committee's November 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.

In the euro area, the ECB continued to undertake monthly asset purchases of €60 billion. In September, ECB staff revised down their projection for inflation in 2016 to 1.1%, well below the ECB's price stability objective of inflation below, but close to, 2%. In his statement following the October policy meeting, the President of the ECB reiterated the Governing Council's intent to continue asset purchases until the end of September 2016, or beyond, until a sustained adjustment in the path of inflation consistent with the price stability objective is seen; a cut to the deposit facility rate was also discussed at the Governing Council's October meeting. Respondents to a Reuters survey in October placed, on average, a 70% weight on the ECB's asset purchase programme being extended beyond September 2016. Short-term forward interest rates have fallen (Chart 1.13), consistent with market participants placing more weight on the likelihood of a deposit rate cut.

The costs of government borrowing for the next ten years in the United Kingdom, United States and the euro area were slightly lower than in the run-up to the *August Report* (Chart 1.14). That partly reflected lower near-term expectations for policy rates, and it also reflected falls in the implicit costs of government borrowing for five years in five years' time: five-year, five-year forward rates were around 0.3 percentage points lower in these economies. Some of those falls reflected a decline in implied inflation rates, perhaps reflecting greater market perceptions of longer-term downside risks to inflation stemming from risks to global growth and commodity prices.

**Chart 1.14 UK, US and euro-area long-term interest rates lower than in August**

International ten-year government bond yields<sup>(a)</sup>

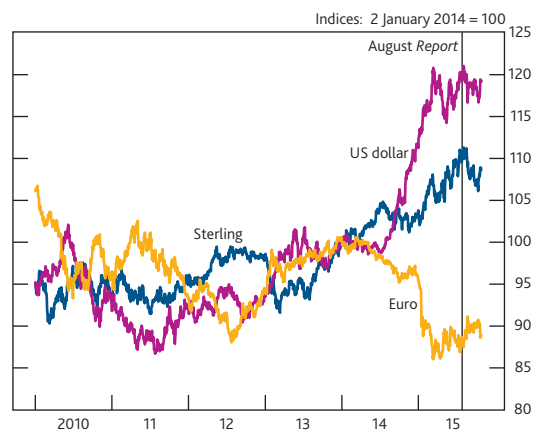


Sources: Bloomberg and Bank calculations.

- (a) Zero-coupon yields on ten-year benchmark government bonds.  
 (b) An estimate based on French and German government bonds.

**Chart 1.15 Euro ERI higher and dollar and sterling ERI lower than in August**

Effective exchange rates



### Exchange rates

Changes in relative growth prospects, policy expectations and risk sentiment tend to be associated with movements in exchange rates. Emerging-economy currencies have depreciated since the *August Report*. In contrast, the euro ERI has risen by 2¼% since August (Chart 1.15). According to market contacts, very low euro-area interest rates had previously encouraged investors to borrow in euros to invest in emerging-economy assets. Much of those flows reversed following the deterioration in risk sentiment in August and September, pushing up the euro exchange rate.



## Monetary policy since the August Report

The MPC's central projection in the *August Report*, under the assumptions that Bank Rate followed a path implied by market interest rates and that the stock of purchased assets remained at £375 billion, was that four-quarter GDP growth would fall back from rates seen in 2014, and settle a little above 2½%. Inflation was expected to remain close to zero in the very near term, returning to the 2% target within two years, and rising slightly above thereafter.

At the MPC's meeting ending on 9 September, the Committee noted that the outlook for domestic activity appeared similar to that at the time of the *August Report*. While global developments did not as yet appear sufficient to alter materially the central outlook, the downside risks to world activity had probably increased. In particular, concerns about China and other emerging economies had grown, resulting in sharp falls in the prices of risky assets. Greater downside risks to the global environment merited close monitoring for any impact on domestic economic activity.

Twelve-month CPI inflation had risen slightly to 0.1% in July, and the near-term outlook for CPI inflation was little changed. The recent slowing in employment growth alongside steady output growth implied that productivity had risen, offsetting the effect of higher wage growth on unit wage costs. Further ahead, the path of inflation would depend upon the evolution of domestic costs and on any medium-term effect of movements in import prices.

Eight Committee members judged that the current stance of monetary policy remained appropriate. Some members nevertheless saw continued upside risks to inflation relative to the target. For one member, these risks were sufficient to justify an immediate increase in Bank Rate, given that building domestic cost pressures would otherwise be likely to lead to inflation overshooting the target in the medium term.

By the time of the MPC meeting ending on 6 October, GDP growth in both the euro area and the United States in the first half of the year had been revised up. Despite increased concerns about growth prospects in China, Chinese activity indicators to date had been steady. A continued slowdown in

emerging market growth remained evident, however, most notably in Brazil and Russia. For some members, recent developments in the global economy indicated that prospects were somewhat weaker than had been assumed at the time of the *August Report*. But for others, these developments had only accentuated the downside risks to the outlook for international activity in the Committee's previous forecasts.

Domestically, data consistent with *Blue Book 2015*, which were released during the month, had confirmed the recent picture of resilient activity, with a gentle deceleration of growth from above its historical average in 2014. Although it was possible that that modest slowing might presage a slightly weaker outlook than had previously been assumed, such gentle decelerations were typical of economic cycles. The latest data still suggested that the expansion had been underpinned by strong private final demand.

The near-term outlook for CPI inflation had weakened slightly on the month, in part reflecting a further decline in the oil price. Although the exchange rate had depreciated slightly since the *August Report*, its substantial appreciation since mid-2013 continued to depress import price growth and so CPI inflation. Wage growth had strengthened over the past year. Productivity growth was beginning to recover, restraining the impact of higher pay on firms' overall costs and therefore inflationary pressure. Although it had risen over the past few quarters, unit labour cost growth would need to strengthen further in order to return inflation sustainably to the 2% target.

For eight members, the current stance of monetary policy remained appropriate in order to meet the Committee's aim of returning inflation to the target within two years. For one member, the prospective increase in domestic costs was sufficient to justify an immediate increase in Bank Rate.

The policy decision at the meeting ending on 4 November, and the factors behind that decision, are set out in the Monetary Policy Summary on pages i–ii of this *Report*, and in more detail in the minutes of the meeting.<sup>(1)</sup>

(1) The minutes are available at [www.bankofengland.co.uk/publications/minutes/Documents/mpc/pdf/2015/nov.pdf](http://www.bankofengland.co.uk/publications/minutes/Documents/mpc/pdf/2015/nov.pdf).

Against the backdrop of that strength in the euro, and broadly consistent with relative interest rate movements, the sterling and US dollar ERIs have depreciated by around 2% and 1¼% respectively since the run-up to the *August Report* (Chart 1.15). The broader picture of sterling appreciation, however, remains: sterling is around 18% above its March 2013 trough.

## 2 Demand and output

Output growth was 0.5% in Q3, having fallen back since mid-2014. While weak global growth and the past appreciation in sterling will weigh on net trade, private sector domestic demand growth is projected to remain resilient, with support from the past easing in credit conditions and continued real income growth.

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

Developments anticipated in August	Developments since August
<b>Cost of credit</b>	<b>Broadly in line with expectations</b>
<ul style="list-style-type: none"> <li>Credit spreads to decline slightly.</li> </ul>	<ul style="list-style-type: none"> <li>Credit spreads declined slightly in 2015 Q3.</li> </ul>
<b>Consumer spending</b>	<b>Broadly in line with expectations</b>
<ul style="list-style-type: none"> <li>Quarterly consumption growth a little above <math>\frac{3}{4}\%</math>.</li> <li>Saving ratio of <math>5\frac{1}{2}\%</math> by 2016 Q1.</li> </ul>	<ul style="list-style-type: none"> <li>Growth was 0.9% in 2015 Q2, and expected to average around <math>\frac{3}{4}\%</math> for the rest of 2015.</li> <li>Saving ratio revised down in <i>Blue Book 2015</i>.</li> </ul>
<b>Housing market</b>	<b>Broadly in line with expectations</b>
<ul style="list-style-type: none"> <li>A rise in mortgage approvals to around 70,000 a month on average in 2015 Q4.</li> <li>House prices to increase by just over <math>\frac{1}{2}\%</math> per month in 2015 Q4 and 2016 Q1.</li> <li>Quarterly housing investment growth to average around 1%.</li> </ul>	<ul style="list-style-type: none"> <li>Mortgage approvals averaged around 70,000 a month in 2015 Q3.</li> <li>Average of Halifax and Nationwide indices rose by around <math>\frac{1}{2}\%</math> per month in Q3.</li> <li>Housing investment fell by 2.7% in 2015 Q2.</li> </ul>
<b>Investment</b>	<b>Slightly weaker than expected</b>
<ul style="list-style-type: none"> <li>Quarterly business investment growth of around <math>1\frac{1}{2}\%</math>.</li> </ul>	<ul style="list-style-type: none"> <li>Past growth revised down in <i>Blue Book 2015</i>. Investment grew by 1.6% in 2015 Q2.</li> </ul>
<b>Exports</b>	<b>Broadly in line with expectations</b>
<ul style="list-style-type: none"> <li>Average quarterly growth in UK exports of slightly below <math>\frac{1}{2}\%</math>.</li> </ul>	<ul style="list-style-type: none"> <li>Exports stronger than expected in Q2, but expected to unwind in H2. There is, however, greater-than-usual uncertainty around those data.</li> </ul>

### 2.1 Output and GDP

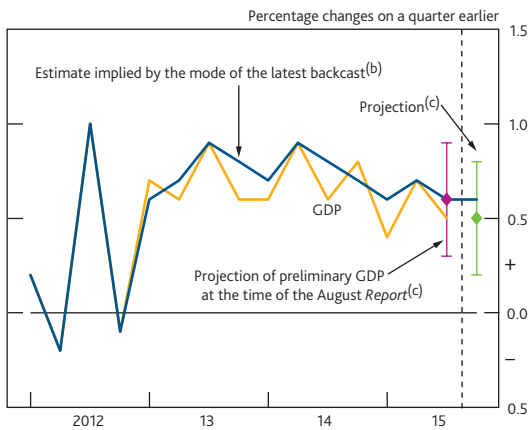
Quarterly output growth in the United Kingdom has fallen back from a peak of 0.9% in 2014 Q2, to 0.5% in 2015 Q3, according to the ONS's preliminary estimate (**Chart 2.1**). While a slowing in growth over the past year had been projected a year ago (see the box on pages 42–43), the Q3 outturn was slightly below Bank staff's expectations at the time of the *August Report* of 0.6%. That weakness was, in large part, due to an unexpected fall in construction output, which subtracted 0.1 percentage points from growth (**Chart 2.2**).

Early estimates of GDP are subject to revision. As explained in the box on page 13, revisions to output since the previous *Report* have done little to change the size, shape or composition of growth over the past few years, although the recovery in output since 2011 now appears a little stronger. The ONS is yet to receive and incorporate the full range of information it uses to produce its mature estimates of GDP from 2013, so those estimates are particularly likely to be revised. The MPC's backcast, which incorporates information such as the pattern of past revisions and business surveys to estimate potential revisions, points to a mature estimate of 0.6% in 2015 Q3 (**Chart 2.1**), and cumulative output growth between 2012 Q4 and 2015 Q3 is projected to be revised up by around 0.7 percentage points.

The extent of the slowing in output growth since 2014 Q2 has varied across industries (**Chart 2.2**). The weakening in construction output growth has been particularly marked, which may in part be related to an earlier slowing in housing market activity (Section 2.2), although survey indicators of construction activity have remained stronger than the official data. Intelligence from the Bank's Agents suggests that the recent weakness in the manufacturing sector has been concentrated in exporters and is related, in part, to the appreciation in sterling and the weakness in global growth (Section 1). The strength of sterling and weak global growth may also have weighed on service sector output growth. Despite a slight slowing in business and financial services

### Chart 2.1 GDP growth slowed in Q3

Bank staff's projections for near-term output growth<sup>(a)</sup>

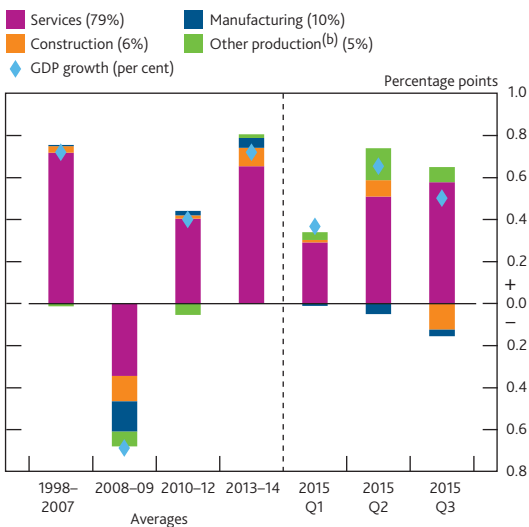


Sources: ONS and Bank calculations.

- (a) Chained-volume measures. GDP is at market prices.  
 (b) The latest backcast, shown to the left of the vertical line, is a judgement about the path for GDP in the mature estimate of the data. The observation for 2015 Q4, to the right of the vertical line, is consistent with the MPC's central projection.  
 (c) The magenta diamond shows Bank staff's central projection for the preliminary estimate of GDP growth for Q3 at the time of the August Report. The green diamond shows the current staff projection for the preliminary estimate of GDP growth for Q4. The bands on either side of the diamonds show uncertainty around those projections based on one root mean squared error of past Bank staff forecasts for quarterly GDP growth made since 2004.

### Chart 2.2 A fall in construction output weighed on GDP growth in Q3

Contributions to quarterly GDP growth by output sector<sup>(a)</sup>



- (a) Chained-volume measure. Figures in parentheses are weights in nominal value added in 2012. Contributions may not sum to total as GDP is at market prices while industry output is gross value added at basic prices, and due to rounding.  
 (b) Includes: mining and quarrying; electricity, gas and water supply; and agriculture, forestry and fishing.

output growth, however, overall growth in service sector output remains robust, in line with its average rate since mid-2010. The strength in oil and gas extraction is likely, in part, to reflect the impact of past high levels of investment. The boost to growth from extraction, however, is likely to be temporary as recent weak investment and low oil prices weigh on output over time.

Evidence from industry surveys suggests that aggregate output is likely to grow at a similar rate in Q4. Reflecting that, output growth is projected to remain at 0.6% in 2015 Q4 — consistent with a preliminary estimate of 0.5% (Chart 2.1). Beyond this, output growth is expected to remain at around this rate, as continued real income growth and some decline in private saving is projected to keep domestic demand growth resilient in the face of adverse external developments (Section 2.2).

There is a risk, however, that developments in emerging economies (Section 1) could affect UK growth prospects by more than expected, both directly through the United Kingdom's balance of income from abroad (Section 2.3) and through the effects of confidence and uncertainty on domestic demand. Measures of financial market volatility increased in August and September and there is some evidence that other measures of uncertainty have begun to pick up (Chart 2.3), which could weigh on domestic demand.

## 2.2 Domestic demand

### Household spending

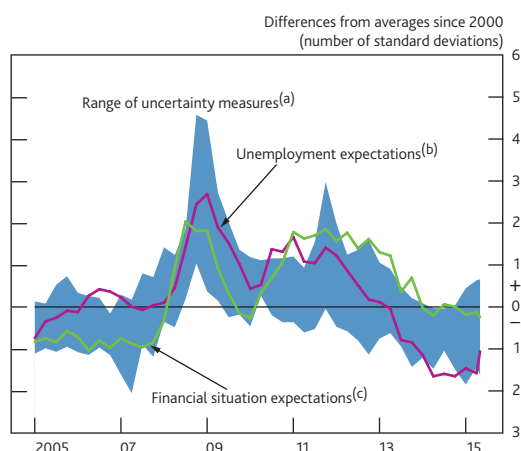
Consumption is often the main driver of domestic demand growth and is the largest component of expenditure, at around 65% of the total. Consumption growth has been strengthening since mid-2013 and was 0.9% in 2015 Q2, in line with its pre-crisis average rate (Table 2.B) and expectations at the time of the August Report. Following the recent Blue Book revisions, consumption growth now appears to have been slightly stronger between 2012 and 2014 (see the box on page 13).

Household consumption growth has been boosted by strong growth in real incomes. Overall real incomes grew by 2.4% in the four quarters to 2015 Q2 (Table 2.C), compared with a little over 1% on average during 2014. Employment growth and a strengthening in average wage growth (Section 3) have supported nominal income growth. In addition, past falls in energy, food and import prices (Section 4) have increased the purchasing power of a given level of nominal income.

Income growth has, however, been outpaced by consumption growth over the past few years (Table 2.C). Having risen during the 2008/09 recession, the household saving ratio has fallen since 2010. But, as explained in the box on page 13, in

### Chart 2.3 Some measures of uncertainty have picked up slightly

Measures of uncertainty and household unemployment and financial expectations



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

- (a) Range includes: CBI measure of demand uncertainty as a factor likely to limit capital expenditure for manufacturing and business/consumer services weighted together using nominal shares in value added. Quarterly average standard deviation of monthly Consensus Economics forecasts for GDP one and two years ahead seasonally adjusted by Bank staff. The standard deviation of daily price movements in the FTSE index and sterling ERI within a quarter. The IBES weighted average standard deviation of twelve-month forward earnings per share forecasts. And the quarterly average of media reports citing 'economic uncertainty' in five national broadsheet newspapers. A higher number indicates greater uncertainty.
- (b) The question asks how households expect the number of people unemployed to change over the next twelve months. Data are quarterly averages.
- (c) Inverted scale. The question asks how households expect their personal financial situation to change over the next twelve months. Data are quarterly averages.

### Table 2.B Private sector domestic demand growth remained resilient in Q2

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

Percentage changes on a quarter earlier

	Averages				2015	
	1998–2007	2008–09	2010–12	2013–14	Q1	Q2
Household consumption <sup>(b)</sup>	0.9	-0.6	0.2	0.6	0.8	0.9
Private sector investment	0.7	-4.2	1.2	1.5	1.6	0.7
of which, business investment <sup>(c)</sup>	0.5	-2.8	1.5	1.1	2.4	1.6
of which, private sector housing investment	0.8	-7.0	0.8	2.9	0.0	-1.2
Private sector final domestic demand	0.8	-1.3	0.4	0.9	0.9	0.9
Government consumption and investment <sup>(c)</sup>	0.8	0.9	-0.1	0.4	1.1	0.7
Final domestic demand	0.8	-0.8	0.3	0.8	1.0	0.8
Change in inventories <sup>(d)(e)</sup>	0.0	0.2	0.1	-0.1	-0.4	-0.7
Alignment adjustment <sup>(e)</sup>	0.0	-0.1	0.0	0.0	0.5	-0.6
Domestic demand <sup>(f)</sup>	0.8	-0.7	0.4	0.7	1.0	-0.6
'Economic' exports <sup>(g)</sup>	1.1	-1.0	0.8	1.0	-1.2	1.9
'Economic' imports <sup>(g)</sup>	1.4	-1.1	0.8	0.9	0.6	-2.7
Net trade <sup>(e)(g)</sup>	-0.1	0.1	0.0	0.0	-0.6	1.4
Real GDP at market prices	0.7	-0.7	0.4	0.7	0.4	0.7
Memo: nominal GDP at market prices	1.3	-0.1	0.9	1.1	0.8	1.2

(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. Official MTIC-adjusted data are not available for exports, so the headline exports data have been adjusted by an amount equal to the ONS import adjustment.

the latest *Blue Book* estimates the saving ratio now appears to have been broadly flat over the past year. And while the saving ratio remains low relative to its pre-crisis average, in part that reflects a fall in income that goes directly into pensions, which may be less relevant for current household spending decisions. Saving out of income available for current consumption is close to its pre-crisis average rate (see **Chart C** in the box on page 13).

One factor that may have supported consumption since 2010, and depressed the saving ratio, is an improvement in households' ability to access credit. Quoted interest rates on both household mortgages and unsecured personal loans have fallen markedly over the past six years, and are close to historical lows (**Chart 2.4**). Over the past few years, the availability of credit to households has improved, and the latest *Credit Conditions Survey* suggested that secured credit availability improved further in Q3. These factors may, in part, be behind a pickup in secured lending and consumer credit growth over the past year. Consumer credit growth was around 8% in the four quarters to Q3, though still below its pre-crisis average rate. And, as set out in the box on page 15, the proportion of household income used for interest payments has fallen as interest rates and the level of household debt relative to income have fallen. Furthermore, according to the NMG Consulting survey conducted in September, the proportion of households with debt reporting concerns about that debt has continued to fall.

Another factor that would tend to influence household saving is confidence about the economic outlook. Household saving rose during the financial crisis, coinciding with elevated levels of uncertainty measures. Both saving and measures of uncertainty then fell back. More recently, however, there have been some increases in measures of household uncertainty (**Chart 2.3**), and the overall GfK measure of consumer confidence has fallen slightly since the summer. That might reflect an increased prominence of economic uncertainty in media coverage and the recent volatility in financial markets (Section 1). Overall, measures of uncertainty remain low relative to pre-crisis levels.

The past improvements in credit conditions and real income growth are projected to continue to support consumption growth in the near term. Although bank funding spreads have widened since August, this is expected to have only a small effect on consumer credit conditions (Section 1). There is a risk, however, that recent events lead to a further and more persistent widening in bank funding spreads and a more marked tightening in credit conditions, or increase in uncertainty, both of which could weigh on consumption growth and domestic demand more generally.

### The housing market

Credit conditions faced by households will also affect their decisions about whether to purchase a home. The demand for

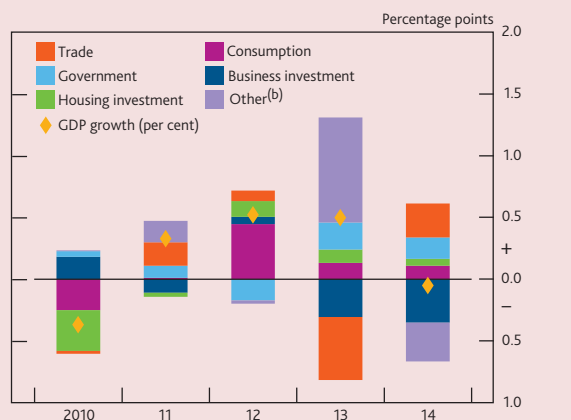
## Revisions to the National Accounts

The *Blue Book* is an annual ONS publication in which the National Accounts data are revised to incorporate methodological improvements and a wider range of information than in earlier estimates. This box sets out the main revisions contained in *Blue Book 2015*, published in October. The revisions to the estimates of the level of GDP were small relative to the revisions in *Blue Book 2014*, where greater methodological changes were made. Further, these latest revisions do little to change the size, shape or composition of UK output growth over the past few years.

The revisions contained in *Blue Book 2015* suggest that the recovery in headline GDP growth since the 2008/09 recession was slightly stronger than previously estimated. The revisions were due primarily to methodological improvements to address the under-coverage of small businesses and concealed income, and the incorporation of new data. Between 2011 and 2013, annual growth rates are estimated to have been 0.4 percentage points higher on average, while growth in 2014 was revised down by 0.1 percentage points. The overall profile of four-quarter GDP growth over the past year, however, remained similar, displaying a gentle deceleration from 3.1% in 2014 Q2 to 2.4% in 2015 Q2.

While there were some changes in the expenditure components of growth, these were mostly small (**Chart A**). The most notable changes were to consumption and investment, although there were revisions to other components as well. The pattern of revisions to consumption growth was similar to that of overall GDP: consumption growth was revised up slightly between 2012 and 2014.

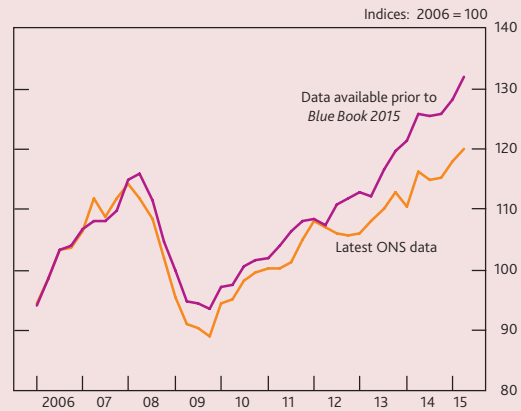
**Chart A Small revisions to the composition of growth**  
Contributions to revisions to GDP by expenditure component<sup>(a)</sup>



(a) Calendar-year growth in chained-volume measures.  
(b) Calculated as a residual. Includes inventories, the alignment adjustment and the statistical discrepancy.

Business investment was revised down and, on current estimates, has risen by around 12 percentage points less since 2006 than in the previous vintage of data (**Chart B**). Much of

**Chart B Business investment was revised down**  
Business investment<sup>(a)</sup>



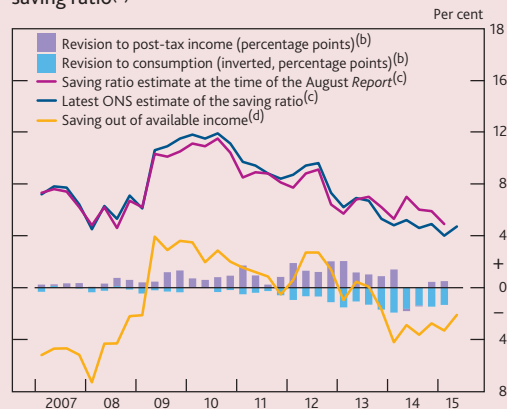
(a) Chained-volume measures.

the revision prior to 2012 reflects a reclassification of Network Rail and Transport for London from the private sector to the public sector, which has limited economic significance. In contrast, the downward revisions to investment growth from 2012 onwards largely reflect the incorporation of new data.

There were also some revisions on the income side of the National Accounts. In particular, estimates of recent growth in wages and salaries were revised down, bringing them more into line with the growth rates implied by employment data from the Labour Force Survey and average weekly earnings. But, as a consequence of the improvements to address under-coverage of small businesses and concealed income, growth in self-employment income between 2007 and 2013 was revised up. The net impact of these revisions to income and the upward revision to consumption is a lower estimate of the saving ratio (**Chart C**). The counterpart to revisions to the household saving ratio was an upward revision to corporate profits and corporate saving.

**Chart C The saving ratio has been broadly flat over the past year**

Revisions to household income, consumption and measures of the saving ratio<sup>(a)</sup>



(a) Includes non-profit institutions serving households.  
(b) Contributions to the total revision in the saving ratio.  
(c) Percentage of household post-tax income.  
(d) Percentage of household post-tax income excluding flows into employment-related pension schemes. Consistent with *Blue Book 2015*.

**Table 2.C Real income growth has supported consumption**  
Household income, consumption and saving

	Averages						
	1998–2007	2010–12	2013	2014		2015	
				H1	H2	Q1	Q2
<b>Percentage changes on a year earlier</b>							
Real post-tax income <sup>(a)</sup>	3.1	0.3	-0.8	0.9	1.3	2.0	2.4
Real post-tax labour income <sup>(b)</sup>	3.1	-0.7	-0.4	1.7	1.4	1.3	2.3
Consumption <sup>(c)</sup>	3.7	0.6	1.9	2.6	2.7	2.8	3.0
<b>Per cent</b>							
Saving ratio <sup>(d)</sup>	8.7	9.8	6.3	5.0	4.8	4.0	4.7
Saving out of available income <sup>(e)</sup>	-2.0	1.7	-0.5	-3.5	-3.2	-3.3	-2.1

(a) Total available household resources divided by the consumer expenditure deflator.

(b) Wages and salaries plus mixed income less taxes plus net transfers, divided by the consumer expenditure deflator.

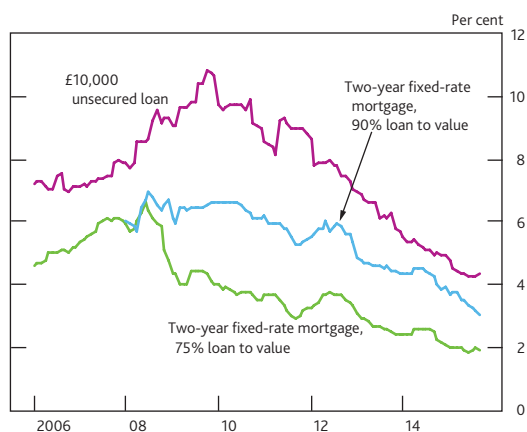
(c) Chained-volume measure. Includes non-profit institutions serving households.

(d) Percentage of household post-tax income.

(e) Percentage of household post-tax income excluding flows into employment-related pension schemes.

**Chart 2.4 Household interest rates are close to historically low levels**

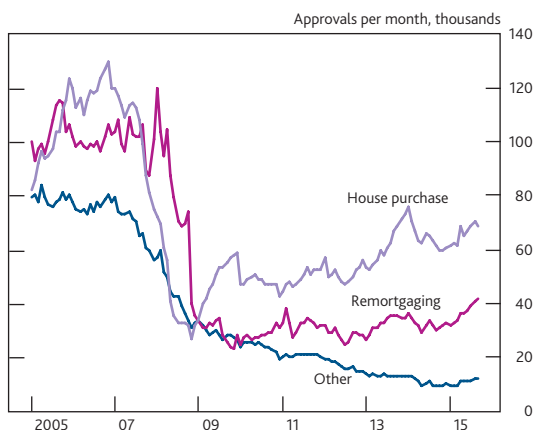
Average quoted household interest rates<sup>(a)</sup>



(a) Sterling-only end-month average quoted rates. 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](http://www.bankofengland.co.uk/statistics/Pages/iadb/notesiadb/household_int.aspx)). Data are non seasonally adjusted.

**Chart 2.5 Mortgage approvals rose in Q3**

Mortgage approvals by type



housing will, in turn, affect the number of homes built and the level of spending on home improvements to some extent.

Perhaps reflecting a slowdown in housing market activity in 2014, the latest estimates imply a small decline in housing investment in the four quarters to 2015 Q2, after robust growth over the previous two years (Table 2.B). In part this was due to a slowing in growth in transaction-related expenditure such as estate agent and legal fees. A more significant factor, however, was slower growth in dwellings investment — expenditure on new homes and on repairs and maintenance. Dwellings investment fell by around 2% in the year to 2015 H1, compared to growth of around 16% in 2014 H1, although these early estimates are often revised significantly.

While activity in the housing market remains subdued relative to pre-crisis levels, it has been gradually picking up, supported by lower mortgage interest rates (Chart 2.4). Having fallen back during 2014, mortgage approvals for both house purchase and remortgaging have risen over the past six months (Chart 2.5). As a consequence, net mortgage lending increased again in September (Chart 2.6).

In the near term, housing investment growth is projected to strengthen gradually. Intelligence gathered from construction companies by the Bank's Agents suggests that growth in house-building activity is currently robust and expected to remain so. Indicators of housing demand remain strong, which should support a further increase in mortgage approvals and transaction-related expenditure. But the Royal Institution of Chartered Surveyors survey suggests that new instructions to sell remain weak, with reports that existing homeowners are reluctant to put their homes on the market until there are more properties to buy. That imbalance between new instructions to sell and new buyer demand may also be putting upward pressure on prices: although average annual inflation in the Halifax and Nationwide house price indices has fallen slightly from its recent peak of around 10% last summer, it remained robust at around 6% in September.

## Business investment

As set out in the box on page 13, business investment growth was revised lower in the recent *Blue Book*, such that the recovery in investment since 2009 now appears less strong than in the earlier estimate. Surveys of investment intentions continue to point to robust rates of investment growth in the near term, and remain consistent with somewhat stronger growth of investment over the past 18 months (Chart 2.7).

Continued resilient domestic demand growth, combined with capacity pressures within companies (Section 3), should support investment growth in the near term. The ONS estimate of the rate of return on capital for non-energy sector private non-financial corporations (PNFCs) is around its

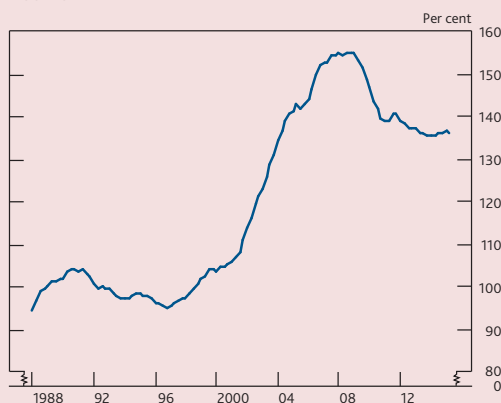
## Household balance sheets

The prospects for household spending depend, in part, on the strength of household balance sheets. Households with high levels of outstanding debt may need to adjust consumption by more in response to changes in their circumstances — such as their income prospects, their ability to borrow or the value of their assets: there is evidence that households with higher levels of debt reduced their consumption by more following the 2008/09 recession than those with lower levels of debt.<sup>(1)</sup> This box examines the evidence on the distribution of household debt, using the results from the latest household survey carried out on behalf of the Bank by NMG Consulting during September 2015.<sup>(2)</sup>

The balance sheet position of households has improved since the start of the financial crisis. The aggregate ratio of household debt to income has fallen (**Chart A**). The NMG survey results also suggest that the distribution of mortgage debt to income has become less skewed: the share of households with mortgage debt in excess of five times their income has continued to decline (**Chart B**). These developments might have reduced the drag on household spending from indebtedness and contributed to the decline in the saving ratio. Despite these improvements, however, the overall debt to income ratio appears to have stabilised at a relatively high level and the proportion of households with mortgage debt between three and five times their income remains similar to that seen immediately prior to the crisis. The desire to pay down debt, therefore, could continue to weigh on spending growth.

### Chart A Aggregate household debt to income is lower than immediately prior to the crisis

Aggregate household debt to income<sup>(a)</sup>

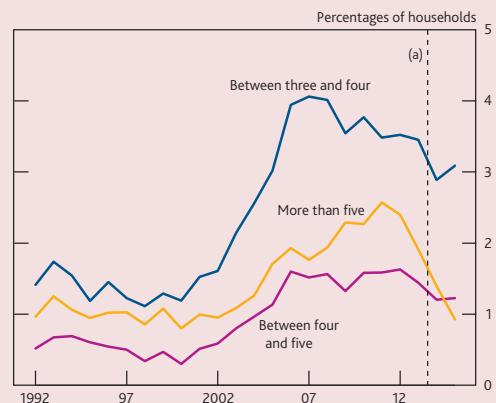


(a) Total financial liabilities as a percentage of the four-quarter moving sum of nominal total household resources.

One of the main ways in which outstanding debt can affect spending is through the cost of servicing it: the greater the cost of existing debt, the less income is left for consumption, the greater the vulnerability to changes in financial circumstances and the greater the incentive to reduce consumption and pay down debt.

### Chart B The proportion of households with high mortgage debt to income has fallen

Proportion of households with high mortgage debt to gross income ratios



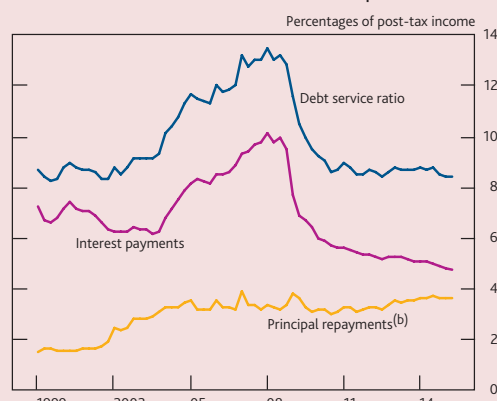
Sources: Living Costs and Food (LCF) Survey, NMG Consulting and Bank calculations.

(a) Data up to 2013 are based on responses to the LCF Survey. Data for 2013 and 2014 are based on responses to the NMG Consulting survey and have been spliced onto the earlier LCF Survey data series.

The proportion of household income spent on servicing debt has remained broadly stable since 2010 (**Chart C**). Interest payments have fallen as a proportion of income as credit conditions have improved and the stock of debt has declined. In contrast, repayments of principal have increased, probably in part reflecting greater voluntary overpayments by borrowers. The NMG survey results also suggest that the proportion of households spending over 30% of their income servicing their mortgage debt has fallen. Past improvements in credit conditions should continue to support spending growth, although in the NMG survey the proportion of households that report putting off spending due to credit concerns remains elevated.

### Chart C The aggregate household debt service ratio has been stable

Household debt service ratio and its components<sup>(a)</sup>



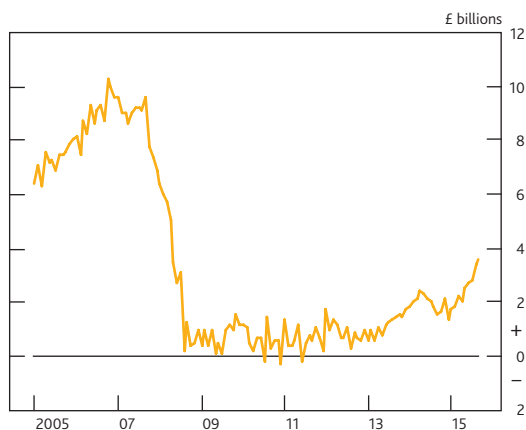
(a) Household debt service ratio calculated as mortgage interest payments plus mortgage principal repayments as a proportion of total household income. Household income has been adjusted to take into account the effects of Financial Intermediation Services Indirectly Measured.

(b) Excludes repayments associated with endowment policies. Non seasonally adjusted.

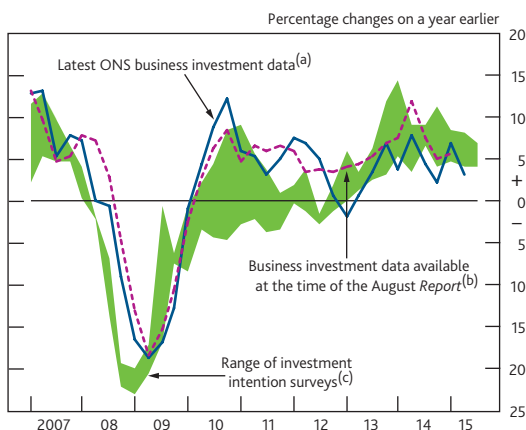
(1) See Bunn, P and Rostom, M (2014), 'Household debt and spending in the United Kingdom', *Bank of England Staff Working Paper No. 554*; [www.bankofengland.co.uk/research/Documents/workingpapers/2015/swp554.pdf](http://www.bankofengland.co.uk/research/Documents/workingpapers/2015/swp554.pdf).

(2) Results from the survey will be analysed in more detail in a forthcoming *Quarterly Bulletin* article.

**Chart 2.6 Net mortgage lending has increased further**  
Monthly net mortgage lending



**Chart 2.7 Surveys suggest robust business investment growth**  
Investment intention surveys and business investment



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

(a) Chained-volume measures. Data are to 2015 Q2.

(b) Chained-volume measures. Data are to 2015 Q1.

(c) Includes survey measures of investment intentions from the Bank's Agents (companies' intended changes in investment over the next twelve months), BCC (net percentage balance of companies who say they have increased planned investment in plant and machinery over the past three months) and CBI (net percentage balance of companies who say they have revised up planned investment in plant and machinery over the next twelve months), scaled to match the mean and variance of four-quarter business investment growth since 2000. BCC data are non seasonally adjusted. Measure weights together sectoral surveys using shares in real business investment. Data are to 2015 Q3.

highest level for 16 years. Lower oil prices (Section 1), however, have been weighing on investment in the extraction sector recently and are likely to continue to do so. Further, the Q3 *Deloitte CFO Survey* suggested that greater uncertainty and the prospect of weakness in emerging economies were holding back investment for some large, internationally orientated companies, which also may weigh on domestic investment growth.

Overall corporate financing conditions appear to have continued to improve in Q3. As discussed in the latest *Credit Conditions Review*, most evidence suggests that the availability of credit for small and medium-sized enterprises continued to ease, while conditions for large firms remained favourable. The widening in corporate bond spreads and increase in volatility in financial markets (Section 1) is, however, likely to weigh a little on capital market issuance. And overall net external finance raised from banks, building societies and capital markets in Q3 was slightly lower than earlier in the year (Chart 2.8). Internal funds are also an important source of financing for investment. PNFC profits have been strong recently, and PNFC deposit growth was a little under 16% in annualised terms in the three months to September, above its pre-crisis average rate of around 8%, which should support investment growth.

### Government spending

The MPC's forecasts are conditioned on continued fiscal consolidation. Estimates from the Institute for Fiscal Studies suggest that, as of fiscal year 2014/15, around half of the planned consolidation relative to the March 2008 *Budget* had taken place. The impact of changes to taxes and public sector pay may have long-lasting effects on private sector expenditure, and will depend on how households and companies react, as set out in the box on page 16 of the *August 2015 Report*.

## 2.3 External demand and UK net trade

### Net trade

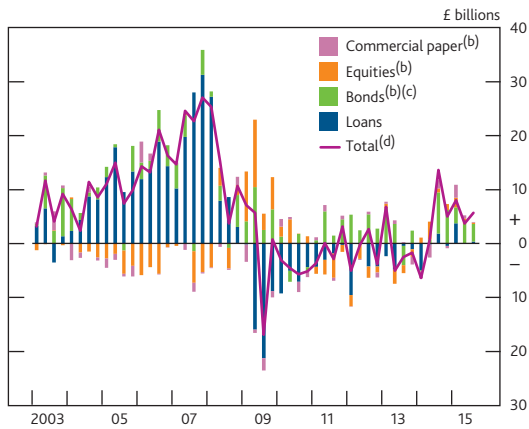
Net trade was strong in Q2 according to the latest estimates, reflecting a sharp fall in import volumes and a rise in exports. Early estimates of National Accounts data are uncertain and subject to revision. Moreover, the ONS released a notice on 2 November outlining some issues relating to the recent trade data, and giving guidance about their use.<sup>(1)</sup> These trade estimates are, therefore, more uncertain than usual. On the current estimates, monthly data on trade in goods for July and August, together with Bank staff estimates, suggest that the contribution to GDP growth from net trade turned negative again in Q3. Revisions to the trade data have not affected the outlook for net trade, which will depend, in part, on

(1) The ONS notice can be found at [www.ons.gov.uk/ons/rel/uktrade/uk-trade/august-2015/index.html](http://www.ons.gov.uk/ons/rel/uktrade/uk-trade/august-2015/index.html).



**Chart 2.8 Net external finance raised was lower in Q3 than earlier in the year**

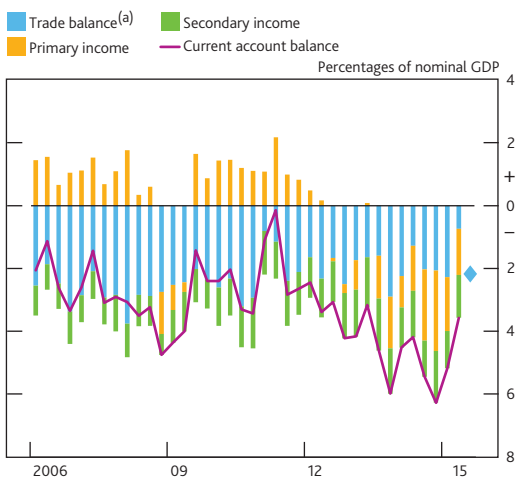
Net external finance raised by PNFCS<sup>(a)</sup>



- (a) Includes sterling and foreign currency funds.  
 (b) Non seasonally adjusted.  
 (c) Includes stand-alone and programme bonds.  
 (d) As component series are not all seasonally adjusted, the total may not equal the sum of its components.

**Chart 2.9 The current account deficit has narrowed since 2014 Q4**

UK current account



- (a) The diamond shows Bank staff's projection for the trade balance in Q3 based on data for July and August.

movements in the sterling exchange rate. Although sterling has depreciated by around 2% since the *August Report*, it remains 18% above its trough in March 2013 (Section 1). That appreciation of sterling, together with weak world GDP growth, is expected to weigh on UK exports and boost imports such that net trade continues to drag on GDP growth over the next few years (Section 5).

A slowing in emerging economies could pose a downside risk to the outlook for net trade. Direct trade links between the United Kingdom and emerging economies — including China — make up around one quarter of UK exports. Further, as set out in the box on page 2, there are a number of other channels through which a slowdown in China could affect the United Kingdom.

The nominal trade balance — exports less imports — is one element of the balance of payments between the United Kingdom and the rest of the world. The trade deficit narrowed to around 0.7% of GDP in Q2. In line with the projection for net trade, the trade deficit is expected to have widened to around 2% of GDP in Q3, close to its average over the past decade (Chart 2.9).

### The current account

In addition to payments relating to net trade flows, there are other payment flows between the United Kingdom and other countries. UK residents receive income on their investments in other countries, and pay out income on the investments that residents of other countries have in the United Kingdom: the net value of these payments makes up the vast majority of the primary income balance.

The current account — the balance of all of these payments, together with other transfers — narrowed to 3.6% of GDP in Q2 (Chart 2.9), but is projected to widen in Q3 along with the trade deficit. Revisions in *Pink Book 2015* reduced the current account deficit between 2012 and 2014 by around 0.5% of GDP on average. As the revisions were larger in more recent years, the deterioration in the current account since 2012 now appears less marked than it did three months ago. The deficit in 2014 is now estimated to have been 5.1% of GDP, compared to 5.9% previously.

The revisions to the current account deficit largely reflect an upward revision to the primary income balance following the incorporation of new data. Although the deterioration in the primary income balance since 2012 now appears less marked, the latest estimates still show a significant weakening, in part, reflecting weak investment income from the euro area. It is unclear for how long this negative income balance will persist: the outlook is highly uncertain, and will be sensitive to global developments.

# 3 Supply and the labour market

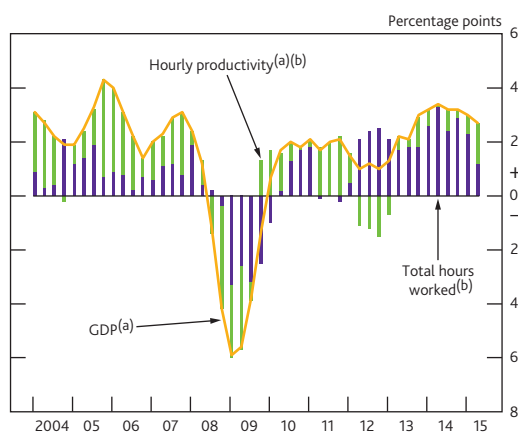
Total hours worked rose modestly in the three months to August, as growth in employment only slightly outweighed a fall in average hours worked. Other indicators, however, suggest that labour demand growth remains robust, and the unemployment rate has fallen slightly. Both wage and productivity growth have picked up since last year, but remain below pre-crisis rates.

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

Developments anticipated in August	Developments since August
<b>Unemployment</b>	<b>Lower than expected</b>
<ul style="list-style-type: none"> <li>Headline LFS unemployment rate to decline to around 5½% by the end of 2015.</li> </ul>	<ul style="list-style-type: none"> <li>The unemployment rate fell to 5.4% in the three months to August and is expected to be slightly lower by the end of the year.</li> </ul>
<b>Participation</b>	<b>Slightly weaker than expected</b>
<ul style="list-style-type: none"> <li>The labour market participation rate to pick up slightly over the rest of the year to a little under 63½%.</li> </ul>	<ul style="list-style-type: none"> <li>Was unchanged in the three months to August. Likely to pick up slightly and remain around 63.4% in the coming quarters.</li> </ul>
<b>Average hours</b>	<b>Weaker than expected</b>
<ul style="list-style-type: none"> <li>Average hours worked to increase by around ½% over the rest of the year.</li> </ul>	<ul style="list-style-type: none"> <li>Average hours fell in the three months to August. Expected to rise slightly in coming quarters.</li> </ul>
<b>Productivity</b>	<b>Stronger than expected</b>
<ul style="list-style-type: none"> <li>Hourly labour productivity growth to average a little under ¼% a quarter.</li> </ul>	<ul style="list-style-type: none"> <li>Hourly labour productivity growth was 1.5% in the four quarters to Q2 and quarterly growth was stronger than expected.</li> </ul>
<b>Earnings growth</b>	<b>Slightly weaker than expected</b>
<ul style="list-style-type: none"> <li>Four-quarter AWE growth to remain around 3¼% in Q3.</li> </ul>	<ul style="list-style-type: none"> <li>Four-quarter AWE growth was 3% in the three months to August.</li> </ul>

**Chart 3.1** Productivity accounted for a greater share of GDP growth in Q2 than in recent quarters

Decomposition of four-quarter GDP growth



Sources: ONS and Bank calculations.

(a) Chained-volume measure, based on the MPC's best collective judgement about the final estimate of GDP. Percentage change on a year earlier.

(b) Based on Bank staff's assumption for population growth, as explained in the *May Report*.

Over the past few years, growth in the supply of output has been accounted for mainly by an increase in total hours worked (**Chart 3.1**), as slack in the labour market has been absorbed and unemployment has fallen. Since 2014 Q4, however, total hours worked have risen only gently (Section 3.1) and the share of output growth accounted for by rising productivity has increased (Section 3.2). Having picked up sharply at the beginning of the year, regular pay growth has changed little in recent months and remains some way below its pre-crisis average rate (Section 3.3).

A key determinant of the extent to which output can grow before it begins to put upward pressure on wages and other domestic costs is the degree of slack in the economy — that is, the level of output relative to potential supply. The pace of wage growth suggests that there is still slack in the labour market, and top-down statistical estimates also suggest demand lies some way below potential supply. Other indicators, however, suggest that supply constraints may be tighter than suggested by wages, and that wage growth could accelerate as the pressures posed by recruitment difficulties and above-average levels of capacity utilisation feed through. Taking all the evidence together, the MPC's best collective judgement is that output remains slightly below its potential level, with slack broadly in the region of ½% of GDP. There is substantial uncertainty about that judgement and a range of views among MPC members.

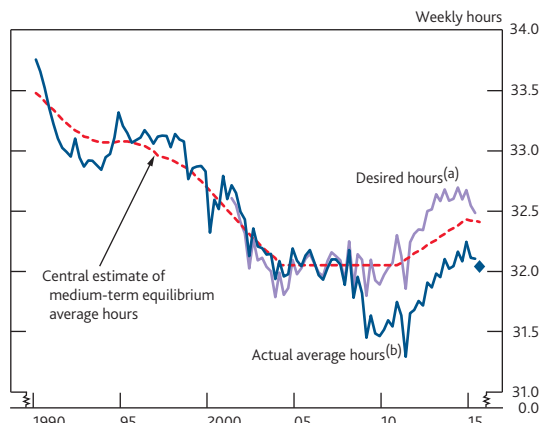
## 3.1 Labour market developments and slack

Total hours worked rose by less than expected in the three months to August. While employment growth was strong at 140,000, average hours worked fell slightly (**Chart 3.2**) against expectations for a rise.

The implications of the softer-than-expected growth in total hours for wages and hence domestic cost pressures will depend on the extent to which it reflects weaker labour demand or tighter labour supply conditions than previously judged. Weaker labour demand would tend to be associated

### Chart 3.2 Average hours have fallen

Average weekly hours: actual, desired and Bank staff's estimate of medium-term equilibrium



Sources: Labour Force Survey (LFS) and Bank calculations.

- (a) Number of hours that the currently employed report that they would like to work, on average, per week calculated from LFS microdata, which have been seasonally adjusted by Bank staff. Calculation based on Bell, D and Blanchflower, D (2013), 'How to measure underemployment?', *Peterson Institute for International Economics Working Paper No. 13-7*. Data available up to 2015 Q2.
- (b) The diamond shows Bank staff's projection for 2015 Q3, based on ONS data to August 2015.

### Table 3.B Indicators of labour demand remain strong

Employment growth, vacancies and survey indicators of employment intentions

	Averages				2015		
	2000-07 <sup>(a)</sup>	2010-12	2013	2014	Q1	Q2	Q3
<b>Employment growth<sup>(b)</sup></b>	70	67	95	152	202	-63	140
<i>of which, employees<sup>(b)</sup></i>	55	33	62	139	189	-54	120
<i>of which, self-employed and other<sup>(b)(c)</sup></i>	16	35	33	14	13	-9	20
<b>Vacancies to labour force ratio<sup>(d)</sup></b>	2.07	1.47	1.66	2.04	2.26	2.23	2.24
<b>Surveys of employment intentions<sup>(e)</sup></b>							
BCC <sup>(f)</sup>	19	8	22	29	27	29	24
CBI <sup>(f)</sup>	5.4	-0.4	13.8	26.8	22.4	28.0	7.9
Agents <sup>(g)</sup>	0.8	0.3	0.4	1.3	1.1	1.3	0.9

Sources: Bank of England, BCC, CBI, CBI/PwC, ONS (including the Labour Force Survey) and Bank calculations.

- (a) Unless otherwise stated.
- (b) Changes relative to the previous quarter in thousands. Figures for 2015 Q3 are data for the three months to August 2015.
- (c) Other comprises unpaid family workers and those on government-supported training and employment programmes classified as being in employment.
- (d) Excludes vacancies in agriculture, forestry and fishing. Average is 2001 Q2 to 2007.
- (e) Measures for the Bank's Agents (manufacturing and services), the BCC (non-services and services) and the CBI (manufacturing, financial services and business/consumer/professional services) are weighted together using employee jobs shares from Workforce Jobs. The BCC data are non seasonally adjusted.
- (f) Net percentage balance of companies expecting their workforce to increase over the next three months.
- (g) End-quarter observation. The scores refer to companies' employment intentions over the next six months. The scores are on a scale of -5 to +5.

with a slower absorption of slack and hence weaker cost pressures. But the implications for wages of weaker labour demand would differ depending on the extent to which it is due to a weaker outlook for demand for goods and services, which would weigh on wage growth, or stronger productivity growth which would be expected to support wage growth. In contrast, tighter supply conditions could indicate that both cost pressures and wage growth will pick up more rapidly as companies attempt to increase their workforce.

### Labour demand and spare capacity within companies

Indicators suggest that labour demand growth has softened somewhat but remains relatively robust (Table 3.B). Survey balances of companies' employment intentions have fallen but remain above their pre-crisis average levels. And the number of vacancies, relative to the size of the labour force, is around its pre-crisis peak.

Moreover, surveys of companies' capacity utilisation indicate that capacity pressures are currently close to or above past average levels (Chart 3.3). So labour demand growth is likely to remain robust as demand for domestic goods and services continues to grow (Section 2). Demand for additional labour will, however, also depend on productivity: if the recent pickup in productivity growth (Section 3.2) is sustained it would temper labour demand, all else equal.

### Average hours worked

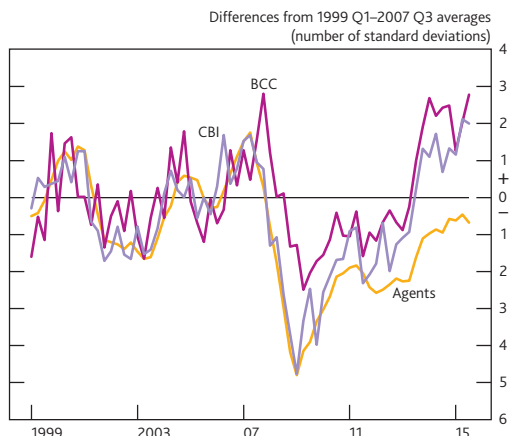
The ability of employers to increase the number of hours worked without putting upward pressure on wage growth, will depend on how many hours employees desire to work. The number of hours people report they would like to work has fallen somewhat over the past six months (Chart 3.2), and the proportion of those in part-time employment because they could not find a full-time job has fallen steadily from its peak in 2013. That is likely to reflect in part the increase in household real incomes (Section 2). As real income growth has picked up, employees may feel able to work fewer hours and still maintain their level of expenditure.

Measures of desired hours remain elevated compared to pre-crisis levels and the MPC judges that there is some scope for average hours to rise over the medium term without putting pressure on wage growth. In other words, the medium-term equilibrium level of average hours is judged to remain above the current level of hours worked (Chart 3.2). There could, however, be less scope for average hours to rise: the fall in reported desired hours may suggest the medium-term equilibrium level has fallen, and a continued increase in real incomes could lead to further falls in desired hours.

### Labour supply

How much employers can continue to increase the size of their workforce without putting upward pressure on wage

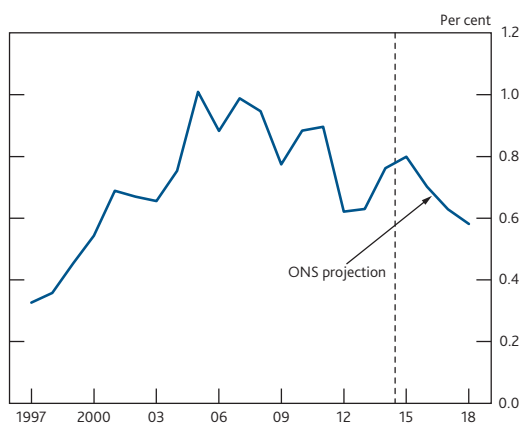
**Chart 3.3 Little sign of spare capacity within companies**  
Survey indicators of capacity utilisation<sup>(a)</sup>



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

(a) Measures are produced by weighting together surveys from the Bank's Agents (manufacturing and services), the BCC (non-services and services) and the CBI (manufacturing, financial services, business/consumer/professional services and distributive trades) using shares in nominal value added. The surveys are adjusted to have a mean of zero and a variance of one over 1999 Q1 to 2007 Q3. The BCC data are non seasonally adjusted.

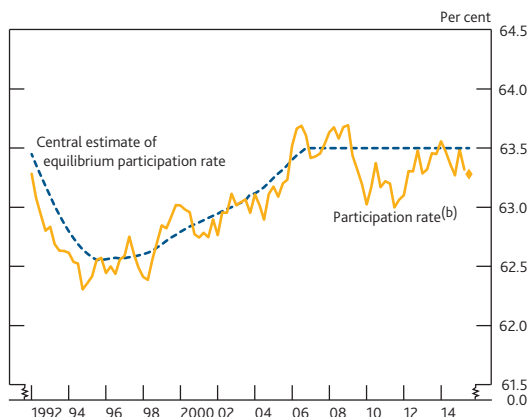
**Chart 3.4 Population growth has been robust**  
Annual population growth<sup>(a)</sup>



Sources: ONS and Bank calculations.

(a) Mid-year 16+ population estimates and projections.

**Chart 3.5 Participation has been broadly stable**  
Participation rate and Bank staff estimates of the medium-term equilibrium participation rate<sup>(a)</sup>



Sources: Labour Force Survey and Bank calculations.

(a) Percentages of 16+ population.  
(b) The diamond shows Bank staff's projection for 2015 Q3, based on ONS data to August 2015.

growth will depend on the size of the population, people's desire to work and their suitability for available jobs.

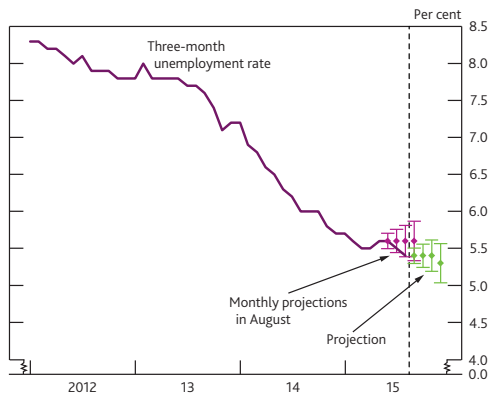
Growth in labour supply derives mainly from population growth. As discussed in the *May Report*, net migration rose during 2014, which led Bank staff to revise up their population growth assumptions in anticipation of revisions to the ONS's population estimates and projections. In October, the ONS revised up its population projections. Changes to the net migration projections were broadly as expected, but the ONS also revised down its projections for natural population change. Overall, the ONS estimates that population growth picked up during 2013–14, but it is projected to slow over the next three years (**Chart 3.4**). These are due to be incorporated into the Labour Force Survey data in 2016. As explained in the box on pages 30–31 of the *May 2015 Report*, while net migration will contribute to labour supply, it will also contribute to domestic demand.

Overall labour supply will depend on the rate of participation. That rate was unchanged in the three months to August compared to the previous three months. As explained in the *May Report*, Bank staff judge that labour force participation is close to its medium-term equilibrium rate (**Chart 3.5**). Consistent with that, the number of economically inactive people reporting to the Labour Force Survey that they want a job remains around its pre-crisis average level.

The influence of those seeking employment on wage growth will depend on the ease with which they can find suitable jobs. Following sharp falls since mid-2013, the unemployment rate has fallen only slightly in recent months and was 5.4% in the three months to August (**Chart 3.6**). The claimant count — a timely indicator of the unemployment rate — has not changed since March. In the near term, unemployment is projected to fall gradually to 5.3% in the three months to December. It then falls a little further over the rest of the MPC's forecast period (Section 5).

Bank staff judge that the long-term equilibrium unemployment rate remains around 5%, although there is considerable uncertainty around that. One upside risk to that estimate is a possible rise in the mismatch between the jobs available and the pool of unemployed. The cycle in unemployment since the start of the crisis seems to have been driven largely by changes in labour demand: as vacancies fell and then rose, so unemployment rose and then fell (**Chart 3.7**). But given the current high level of vacancies, the unemployment rate is somewhat higher than would be suggested by their pre-crisis relationship. The shift in the relationship between vacancies and unemployment may suggest that the composition of the unemployed has become less well matched to the available jobs. That would mean that further falls in the unemployment rate would be associated with upward pressure on wage growth, which would be

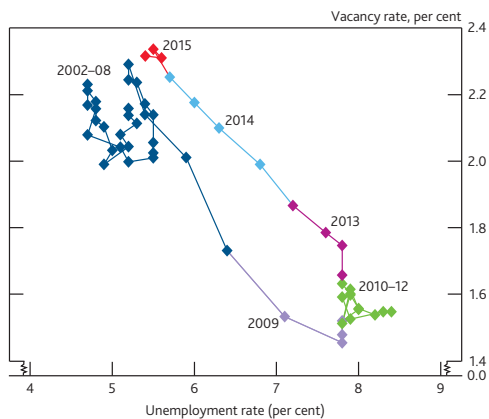
**Chart 3.6 Unemployment likely to fall gradually**  
Bank staff's near-term unemployment rate projection<sup>(a)</sup>



Sources: Labour Force Survey (LFS) and Bank calculations.

(a) The magenta diamonds show Bank staff's central projections for the headline unemployment rate for June, July, August and September 2015, at the time of the August Report. The green diamonds show the current staff projections for the headline unemployment rate for September, October, November and December 2015. The bands on either side of the diamonds show uncertainty around those projections based on one root mean squared error of past Bank staff forecasts for the three-month LFS unemployment rate.

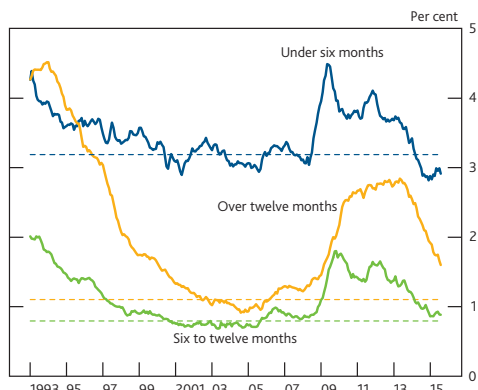
**Chart 3.7 Unemployment has been high relative to vacancies since 2010**  
Vacancy and unemployment rates<sup>(a)</sup>



Sources: Labour Force Survey and Bank calculations.

(a) Vacancies expressed as a percentage of the sum of total employment and vacancies, and unemployment as a percentage of the economically active 16+ population. Vacancies exclude agriculture, forestry and fishing. Quarterly data except for the final data point, which shows unemployment for the three months to August 2015; the vacancy rate is calculated using vacancies data to September 2015 and employment data for the three months to August.

**Chart 3.8 Long-term unemployment remains elevated**  
Unemployment rates by duration<sup>(a)</sup>



Sources: Labour Force Survey and Bank calculations.

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

consistent with reports of elevated recruitment difficulties. Indeed, the Bank's Agents report that recruitment difficulties have increased over the past year and are above pre-crisis levels.

The shift in the relationship between vacancies and unemployment, however, is likely to prove temporary. Those who have been out of work for longer tend to find it harder to find a suitable job. And, while the proportion of people out of work for less than a year is below its pre-crisis average rate, the proportion out of work for more than a year remains elevated (**Chart 3.8**). So the unemployment rate is likely to continue to fall gradually as those long-term unemployed move into employment.

The long-term equilibrium unemployment rate could also be lower than judged, reflecting the impact of structural changes. Over the past two decades, greater participation among older age groups and the continued increase in educational attainment have tended to be associated with increased employment rates; if these trends continue, they could lead to a lower average unemployment rate than in the past.

Changes in government policy over recent decades will also affect the long-term equilibrium unemployment rate. For example, it is possible that the introduction of the National Living Wage could put some upward pressure on both wages and unemployment.<sup>(1)</sup> But other changes, such as to welfare policies, may have increased the incentive to move into employment. The overall effect of these policy changes on unemployment is highly uncertain.

On the whole, the MPC judges that risks around the long-term equilibrium unemployment rate of 5% are broadly balanced, though there are a range of views among MPC members.

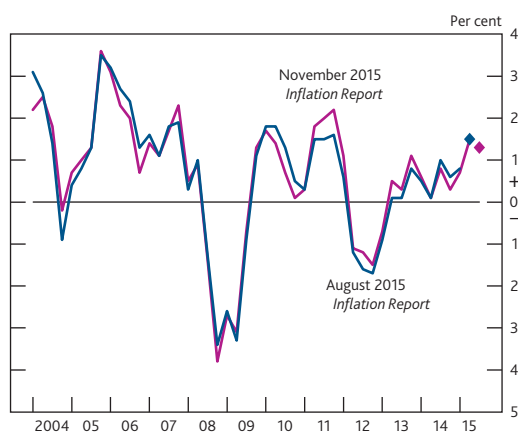
## 3.2 Productivity

Another key determinant of supply and wage growth is productivity. Revisions in *Blue Book 2015* indicate that productivity growth has been slightly stronger between 2011 and the first half of 2014 than had been expected at the time of the August Report (**Chart 3.9**). And having picked up sharply in 2015 Q2, four-quarter hourly productivity growth is likely to have slowed only slightly to 1.3% in Q3.

The recent pickup in productivity growth appears, in part, to reflect a waning in some of those factors that had previously been dragging on its underlying trend, such as past weak investment in both physical capital and 'intangible' capital such as employees' skills, and slow adoption of the latest

(1) For further discussion of the impact of the National Living Wage see the box on page 24 of the August 2015 Report; [www.bankofengland.co.uk/publications/Documents/inflationreport/2015/avg.pdf](http://www.bankofengland.co.uk/publications/Documents/inflationreport/2015/avg.pdf).

**Chart 3.9 Productivity growth has picked up**  
Four-quarter hourly labour productivity growth<sup>(a)</sup>



Sources: ONS and Bank calculations.

(a) GDP per hour worked, based on the backcast for the final estimate of GDP. Based on Bank staff's assumption for population growth, as explained in the *May Report*. The blue and magenta diamonds show Bank staff's projection for Q2 at the time of the *August Report* and their current projection for Q3 respectively.

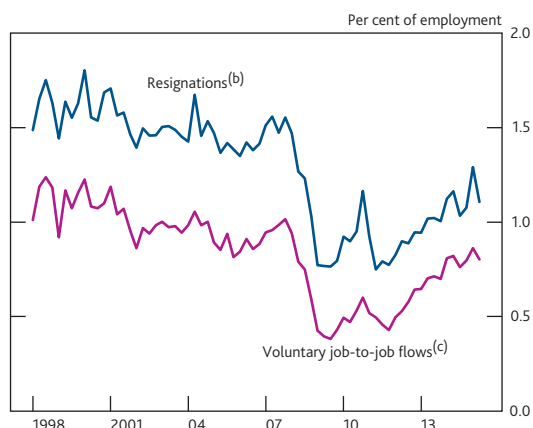
**Table 3.C Regular pay growth is likely to soften slightly in Q3**  
Whole-economy earnings

	Averages				2015		
	2001–07	2008 Q3– 2010 Q2	2014 H1	2014 H2	Q1	Q2	Q3
<b>Percentage changes on a year earlier</b>							
(1) Total AWE <sup>(a)</sup>	4.3	1.4	0.9	1.6	2.3	2.6	3.2
(2) AWE regular pay <sup>(a)(b)</sup>	4.0	2.1	1.0	1.6	2.3	2.8	2.6
(1)–(2) Bonus contribution <sup>(a)(c)</sup>	0.3	-0.7	-0.1	0.1	0.0	-0.2	0.7
Pay settlements <sup>(d)</sup>	3.2	2.5	2.0	2.1	2.0	2.2	2.2
Memo: private sector regular pay <sup>(a)</sup>	3.9	1.6	1.3	1.9	2.8	3.3	3.0

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

(a) Figures for 2015 Q3 are estimated based on data for July and August and Bank staff's projections for September.  
 (b) Whole-economy total pay excluding bonuses and arrears of pay.  
 (c) Percentage points. The bonus contribution does not always equal the difference between total average weekly earnings (AWE) growth and AWE regular pay growth due to rounding.  
 (d) Average over the past twelve months, based on monthly data.

**Chart 3.10 Flows between jobs remain subdued**  
Resignations and voluntary job-to-job flows<sup>(a)</sup>



Sources: Labour Force Survey and Bank calculations.

(a) Based on two-quarter longitudinal microdata. Seasonally adjusted by Bank staff. Expressed as a percentage of 16–64 employment.  
 (b) Number of people who report resigning three months ago, and report being employed, unemployed or inactive.  
 (c) Number of people who report resigning three months ago, and report being in employment for less than three months.

technology.<sup>(1)</sup> As the effect of these factors continues to diminish that should support productivity growth. Further, the Bank's Agents report that some employers are responding to recruitment difficulties by trying to increase the productivity of their existing workforce.

Some of the recent pickup in productivity growth may also reflect the impact of cyclical and compositional factors on measured productivity growth. Some companies may have been working at above normal capacity to meet demand (**Chart 3.3**) and hence measured productivity growth may ease as capacity pressures ease. Acting in the opposite direction, compositional effects appear to have been weighing on measured productivity growth over the past 18 months as employment growth was concentrated in lower-skilled roles. This could have dragged on overall productivity growth if these roles have typically been less productive than an average role. The impact of those effects, however, appears to have lessened in Q2 and may have helped support measured productivity growth.

The MPC judges that productivity growth is likely to slow a little in the near term before picking up modestly over the next few years, as the factors weighing on it wane further (**Section 5**). Although there is substantial uncertainty around this judgement.

### 3.3 Wages

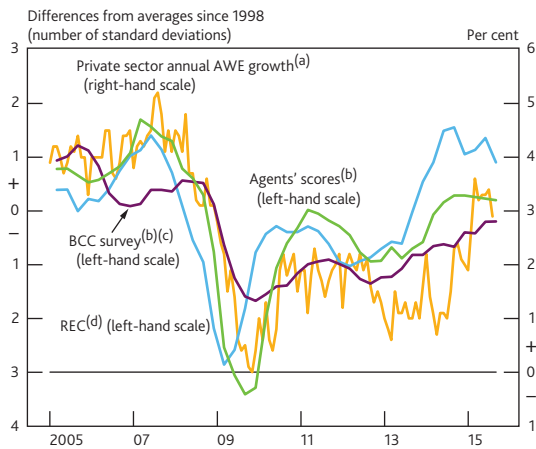
Pay growth is a key determinant of domestic cost pressures (**Section 4**), and will reflect both slack in the economy and productivity growth. Wage growth has been volatile in recent quarters. This partly reflects changes in bonus payments, which may not be a good indicator of underlying wage pressures. Stripping out bonuses, regular pay growth has picked up by around 2 percentage points since 2014 Q2 (**Table 3.C**), although it has been broadly unchanged in recent months and was 2.8% in the three months to August.

Despite the pickup in wage growth over the past year, it remains some way below its pre-crisis average rate. That in part could be because the impact of the tightening labour market (**Section 3.1**) on wages has been slow to come through or has been masked. Job-to-job flows and resignations have remained relatively low (**Chart 3.10**), which could be limiting the influence of starting salaries on average wage growth. The REC survey has suggested stronger growth in starting salaries than average wages for some time, although that balance has fallen somewhat over the past year (**Chart 3.11**). As confidence in the job market among existing employees improves further, those higher starting salaries and the need

(1) See page 25 of the *May 2015 Inflation Report* for a discussion of how changes in the composition of the labour force, impaired resource allocation and weak investment had been weighing on productivity growth;  
[www.bankofengland.co.uk/publications/Documents/inflationreport/2015/may.pdf](http://www.bankofengland.co.uk/publications/Documents/inflationreport/2015/may.pdf).

### Chart 3.11 Earnings growth has picked up over the year but remains weak

Private sector earnings and indicators of pay growth



Sources: Bank of England, BCC, KPMG/REC/Markit, ONS and Bank calculations.

- (a) Excludes bonuses and arrears of pay.
- (b) The Bank's Agents' scores and the BCC survey are produced by weighting together indices for the manufacturing and service sector according to their employment shares. The Bank's Agents' scores are the end-quarter score.
- (c) Four-quarter moving average measure. Non seasonally adjusted.
- (d) The REC measure is produced by weighting together survey indices for the pay of permanent and temporary placements using shares in employment, quarterly averages.

to retain staff are likely to pull wage growth up further. The Bank's Agents report that some employers are intending to respond to recruitment difficulties by offering increased wages to new recruits and existing staff with key skills.

Changes in the composition of the workforce (Section 3.2) may be another reason why measured wage growth may not reflect underlying capacity pressures in the economy. Bank staff estimate that the drag on annual wage growth from compositional factors was around  $\frac{1}{2}$  a percentage point in 2015 Q2, though this was smaller than the estimate for Q1, of around 1 percentage point.

As explained in the *August Report*, the introduction of a National Living Wage is also likely to add to wage growth over coming years. The overall impact on average wage growth is estimated to be very small, at less than 0.1 percentage points per year. But the National Living Wage is likely to disproportionately affect the wages of those in some sectors, such as hospitality, retail and support services.

Wage growth is expected to continue to be volatile in the near term, due to the timing of bonus payments (Table 3.C). Beyond that, given developments in the labour market (Section 3.1), wage growth is expected to pick up, further outstripping productivity growth as the effects of the absorption of slack are passed through (Section 5).

# 4 Costs and prices

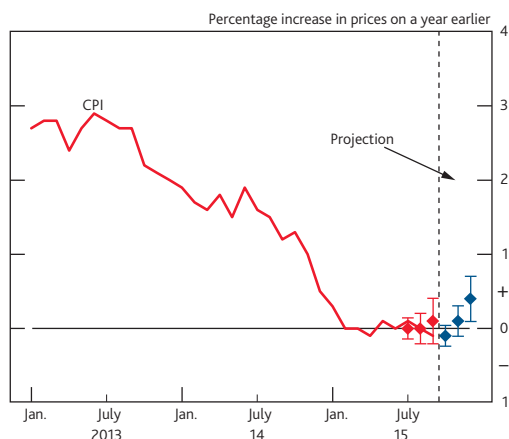
CPI inflation was -0.1% in September. The current low level of inflation can largely be accounted for by lower energy, food and other imported goods prices, although it also reflects muted domestic cost growth. Inflation is projected to pick up over coming months, but less quickly than projected in August. Unit labour cost growth rose to 1.8% in Q2 and is projected to strengthen further, consistent with inflation rising back to the 2% target in around two years. Inflation expectations remain broadly consistent with the MPC's 2% target.

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

Developments anticipated in August	Developments since August
<b>Unit labour costs</b>	<b>Broadly on track</b>
<ul style="list-style-type: none"> <li>Four-quarter whole-economy unit labour cost growth to reach 2% by the end of the year.</li> </ul>	<ul style="list-style-type: none"> <li>Four-quarter unit labour cost growth was 1.8% in Q2.</li> </ul>
<b>Household energy prices</b>	<b>Weaker than expected</b>
<ul style="list-style-type: none"> <li>Petrol and diesel prices to fall by around 4% in Q3.</li> <li>Domestic gas prices to fall by 5% by the end of the year. Domestic electricity prices to remain flat.</li> </ul>	<ul style="list-style-type: none"> <li>Petrol and diesel prices fell by 6% in Q3. Further falls in oil prices likely to weigh on prices.</li> <li>Domestic gas price cuts expected a little later than at the time of August Report.</li> </ul>
<b>Import prices</b>	<b>Broadly on track</b>
<ul style="list-style-type: none"> <li>Import prices to be broadly flat in 2015 Q4 and 2016 Q1.</li> </ul>	<ul style="list-style-type: none"> <li>Import prices excluding fuel and erratics fell by 1% in the four quarters to 2015 Q2 according to the latest estimate. There is, however, greater-than-usual uncertainty around those data.</li> </ul>
<b>Inflation expectations</b>	<b>Broadly on track</b>
<ul style="list-style-type: none"> <li>Indicators of inflation expectations consistent with meeting the 2% inflation target in the medium term.</li> </ul>	<ul style="list-style-type: none"> <li>Movements in indicators of inflation expectations have been mixed. On balance, measures are broadly consistent with the 2% target.</li> </ul>

**Chart 4.1** CPI inflation projected to rise by the end of the year

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



(a) The red diamonds show Bank staff's central projection for CPI inflation in July, August and September 2015 at the time of the August Inflation Report. The blue diamonds show the staff projection for October, November and December 2015. The bands on each side of the blue and red diamonds show the root mean squared error of the projections for CPI inflation one, two and three months ahead made since 2004.

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

CPI inflation was -0.1% in September, lower than projected at the time of the August Report (Chart 4.1) due to weaker energy and clothing and footwear prices. As inflation remains more than 1 percentage point below the 2% inflation target, the Governor has written a fourth consecutive open letter to the Chancellor as required by the MPC's remit.<sup>(1)</sup>

Roughly four fifths of the current weakness in inflation relative to the target — 1.7 percentage points — is due to past falls in energy, food and other goods prices. Those falls are judged predominantly to reflect global factors: compared with a year ago, the US dollar oil price is around 44% lower and agricultural commodity prices are around 11% lower. In addition, the 18% appreciation of sterling since its trough in March 2013, and the resulting falls in imported goods prices (Section 4.2), will also have weighed on UK inflation.

Around one fifth of the weakness in inflation relative to the target — 0.4 percentage points — is due to weak services price inflation. While some services are imported and will be affected by changes in import prices, the weakness in services inflation is judged largely to reflect subdued domestic cost pressures. A consequence of the slack that opened up in the labour market after the 2008/09 recession has been relatively low growth of wages (Section 3) and hence domestic costs.

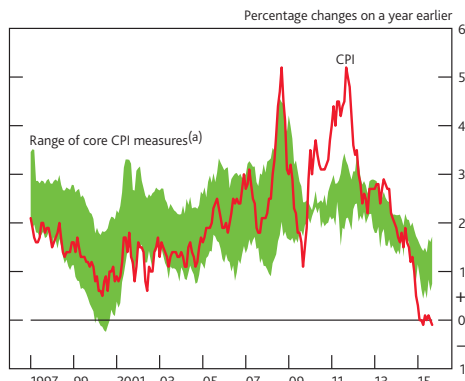
A range of measures of core inflation — which exclude volatile components such as food and energy prices — averaged around 1% in September (Chart 4.2).<sup>(2)</sup> Some of the weakness in core inflation is likely to reflect the impact of falls in import prices, which will have affected the prices of many goods and

(1) The letter can be found at [www.bankofengland.co.uk/monetarypolicy/Documents/pdf/cpiletter051115.pdf](http://www.bankofengland.co.uk/monetarypolicy/Documents/pdf/cpiletter051115.pdf).

(2) For a detailed discussion of core inflation measures see the box on pages 28–29 of the August 2015 Report; [www.bankofengland.co.uk/publications/Documents/inflationreport/2015/aug.pdf](http://www.bankofengland.co.uk/publications/Documents/inflationreport/2015/aug.pdf).



**Chart 4.2 Core inflation measures average around 1%**  
Measures of core CPI inflation



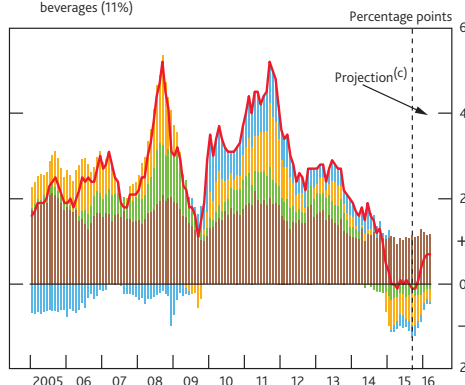
Sources: ONS and Bank calculations.

(a) Swathe includes measures of CPI, adjusted by Bank staff for changes in VAT, excluding: food and energy; food, non-alcoholic beverages and energy; food, non-alcoholic beverages, alcohol, energy and tobacco; food, non-alcoholic beverages, alcohol, energy, tobacco and education. It also includes the weighted median inflation rate of the 85 CPI sub-components and a measure where component weights in CPI are multiplied by the inverse of the past volatility of that component. Where series have been adjusted for VAT there is uncertainty around the precise impact of the changes in the rate of VAT.

**Chart 4.3 The drag on inflation from past energy price falls is likely to diminish**

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

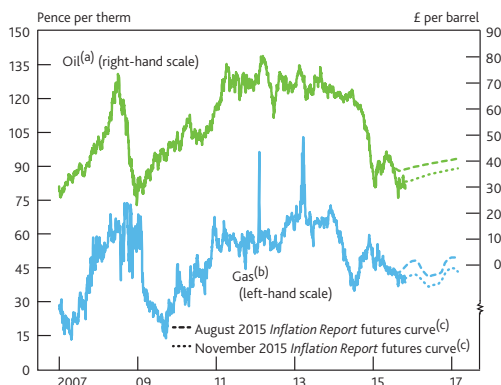
Services (47%) Energy (8%) CPI (per cent)  
Food and non-alcoholic beverages (11%) Other goods<sup>(b)</sup> (35%)



Sources: Bloomberg, Department of Energy and Climate Change, ONS and Bank calculations.

(a) Contributions to annual CPI inflation. Figures in parentheses are weights in the CPI basket in 2015, and may not sum to 100 due to rounding.  
(b) Calculated as the difference between CPI inflation and the other contributions identified in the chart.  
(c) Bank staff estimates. Electricity, gas and other fuels estimates are conditioned on the assumption that utilities companies reduce gas prices by an average of 5% in early 2016. Fuels and lubricants estimates use Department of Energy and Climate Change petrol price data for October 2015 and are then based on the November 2015 sterling oil futures curve shown in **Chart 4.4**.

**Chart 4.4 Wholesale energy prices have fallen since August**  
Sterling oil and wholesale gas prices



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

(a) Brent forward prices for delivery in 10–25 days' time converted into sterling.  
(b) One-day forward price of UK natural gas.  
(c) Averages during the fifteen working days to 29 July 2015 and 28 October 2015 respectively.

services. But it will also reflect subdued domestic cost pressures over the recent past.

Inflation is projected to start rising over coming months as the past falls in energy prices start to drop out of the annual comparison (**Chart 4.3**). CPI inflation is projected to rise to 0.4% in December, and to 0.7% in March 2016. That profile is weaker than projected three months ago. That in part reflects further falls in oil prices (Section 1). US dollar oil futures prices are around 11% lower, while in sterling terms prices are around 10% lower than in August (**Chart 4.4**). Those declines have reduced the inflation projection, relative to the *August Report*, by around 0.1 percentage points until 2016 H2 (**Chart 4.5**). It also reflects the weaker outturn for clothing and footwear prices, which will weigh on CPI inflation a little more than previously expected.

Wholesale gas futures prices have also fallen further since the *August Report*, and are around 10% lower than three months ago (**Chart 4.4**). One of the major domestic energy suppliers cut its gas prices by 5% from the end of August. As in the *August Report*, the other five major household suppliers are assumed to reduce their prices by a similar amount though that is now assumed to occur in early 2016, slightly later than previously assumed. Given the further fall in wholesale gas prices, domestic energy prices are assumed to be reduced further in late 2016. Overall, the contribution of domestic energy prices to annual CPI inflation is projected to average around -0.1 percentage points over 2016–17.

The outlook for inflation in the medium term will depend on the outlook for import prices and the extent to which past falls are still to be passed through fully to CPI (Section 4.2), on the extent to which domestic cost growth rises as the remaining slack in the economy is absorbed (Section 4.3) and on inflation expectations (Section 4.4). Overall, the MPC projects that inflation will return to the 2% inflation target in around two years, as domestic cost growth picks up and the drag from past falls in import prices wanes (Section 5).

## 4.2 Imported price pressures

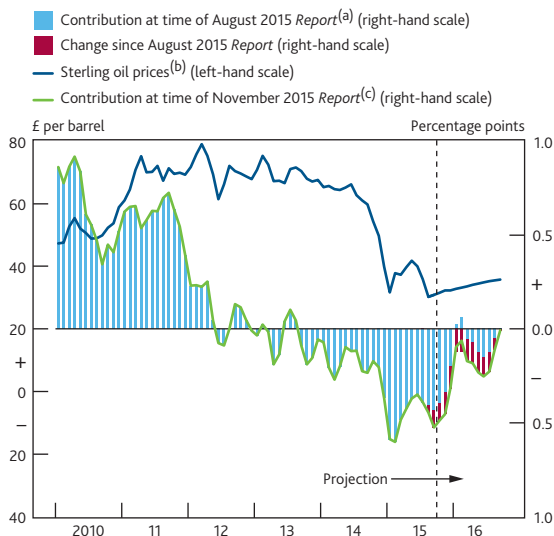
As well as lower energy prices, a factor weighing on businesses' costs and CPI inflation has been weak import price inflation. In part that reflects lower global commodity prices and subdued inflation rates in many countries: foreign export prices have fallen by around ½% over the past two years. The appreciation of sterling since March 2013 (Section 1) means the fall in foreign export prices in sterling terms has been much larger, at around 12% over the past two years.

As discussed in the ONS notice released on 2 November,<sup>(1)</sup> due to a number of issues with the National Accounts measure of the import price deflator, the ONS has advised

(1) The ONS notice can be found at [www.ons.gov.uk/ons/rel/uktrade/uk-trade/august-2015/index.html](http://www.ons.gov.uk/ons/rel/uktrade/uk-trade/august-2015/index.html).

### Chart 4.5 Fuel prices projected to drag on inflation for longer than in the August Report

Sterling oil prices and contribution of fuels to CPI inflation

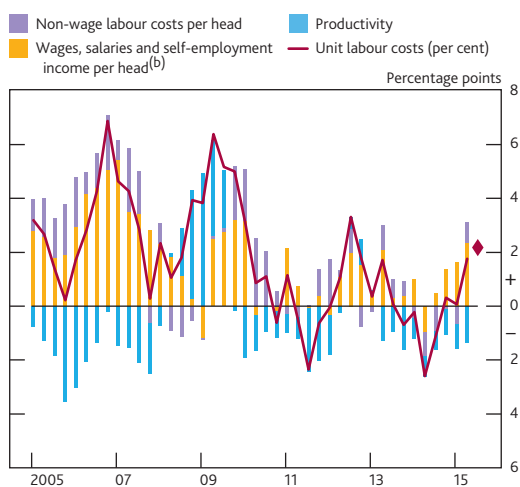


Sources: Bank of England, Bloomberg, Department of Energy and Climate Change, ONS, Thomson Reuters Datastream and Bank calculations.

- (a) Bank staff estimates. Fuels and lubricants estimates use Department of Energy and Climate Change petrol price data for July 2015 and are then based on the August 2015 sterling oil futures curve shown in Chart 4.3 of the August Report.  
 (b) Monthly averages of the oil price data and futures curve shown in Chart 4.4.  
 (c) Bank staff estimates. Fuels and lubricants estimates use Department of Energy and Climate Change petrol price data for October 2015 and are then based on the sterling oil futures curve shown in the chart.

### Chart 4.6 Unit labour cost growth projected to rise further in Q3

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



Sources: ONS and Bank calculations.

- (a) Unit labour costs are calculated as total labour costs divided by GDP, based on the backcast of the final estimate of GDP. Estimates are consistent with Bank staff's assumption for population growth, as explained in the May Report. The diamond shows Bank staff's projection for 2015 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.

using the goods import price index weighted together with the service imports deflator to assess changes in UK import prices. According to those estimates, import prices for goods and services excluding fuel and erratic factors<sup>(1)</sup> have fallen by around 3% over the past two years, a somewhat smaller fall than implied by the data available at the time of the August Report. Due to the greater-than-usual uncertainty around those data, the revisions have not been allowed to affect the MPC's projections (Section 5).

Notwithstanding the recent revisions, the fall in UK import prices has been smaller than might have been expected given the appreciation in sterling. As explained in the box on pages 28–29, on average, around 60% of any change in sterling foreign export prices is reflected in UK import prices. But that relationship is highly uncertain and can vary considerably over time. In the August Report, the MPC noted that import prices had not fallen as much as expected following sterling's appreciation up until the spring, and judged it unlikely that that appreciation would give rise to any further decline in import prices. In the run-up to the November Report, the sterling ERI was at a similar level to that in the spring (Section 1).

The falls in import prices since 2013 will have been an important factor weighing on CPI inflation and measures of core inflation (Section 4.1). As explained in the box on pages 28–29, the scale and timing of the pass-through of import prices to consumer prices is highly uncertain. Changes in import prices are likely to affect the prices of goods more than services, due to the higher imported content of goods in the CPI basket. Indicators of near-term cost and pricing pressures in the manufacturing sector, which are a leading indicator of consumer goods prices and will in part reflect imported price pressures, remain muted.<sup>(2)</sup> The MPC's best collective judgement is that the drag from import prices on CPI inflation will be protracted and diminish only gradually over the forecast period, such that the drag from the past falls in import prices is likely still to be affecting inflation in two years' time (Section 5).

## 4.3 Domestic cost pressures

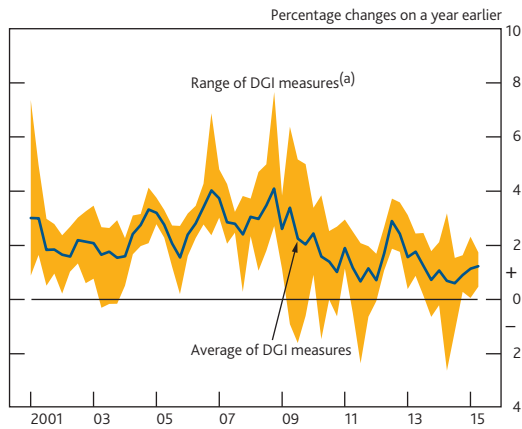
In addition to imported costs, domestic cost pressures, in particular unit labour costs, are a key driver of CPI inflation. In the four quarters to 2015 Q2, whole-economy unit labour cost growth picked up to 1.8% (Chart 4.6), from around -1% during 2014, according to a measure using National Accounts compensation data and the MPC's backcast for GDP growth. Some of this rise reflects faster wage growth relative to productivity (Section 3). Growth of self-employment income

(1) The ONS defines erratic factors as ships, aircraft, precious stones, silver and non-monetary gold.

(2) For a broader discussion of indicators of supply chain pricing pressures see pages 29–31 of the August Report; [www.bankofengland.co.uk/publications/Documents/inflationreport/2015/aug.pdf](http://www.bankofengland.co.uk/publications/Documents/inflationreport/2015/aug.pdf).

### Chart 4.7 Domestically generated inflation has picked up slightly

Measures of domestically generated inflation (DGI)



Sources: ONS and Bank calculations.

(a) Includes: whole-economy unit labour costs (as defined in footnote (a) of Chart 4.6); private sector unit wage costs (private sector AWE divided by private sector productivity); the GDP deflator; the GDP deflator excluding government; and the services producer prices index.

**Table 4.B** Indicators of inflation expectations<sup>(a)</sup>

Per cent	2000 (or start of series to 2007 averages <sup>(b)</sup> )	Averages since 2008	2013	2014		2015				
				H1	H2	Q1	Q2	Q3	Q4 <sup>(c)</sup>	
<b>One year ahead inflation expectations</b>										
<b>Households<sup>(d)</sup></b>										
Bank/GfK	2.4	3.2	3.5	2.7	2.7	1.9	2.2	2.0	n.a.	
Barclays Basix	2.8	2.9	2.8	2.4	2.2	1.7	1.3	1.6	n.a.	
YouGov/Citigroup (Nov. 2005)	2.5	2.5	2.7	2.2	1.9	1.2	1.2	1.5	1.4	
<b>Companies (2008 Q2)<sup>(e)</sup></b>	n.a.	0.5	0.4	0.7	0.4	0.3	0.3	0.4	n.a.	
<b>Financial markets (Oct. 2004)<sup>(f)</sup></b>	2.6	2.7	3.0	2.9	2.8	2.5	2.6	2.5	2.5	
<b>Two to three year ahead expectations</b>										
<b>Households<sup>(d)</sup></b>										
Bank/GfK (2009 Q1)	n.a.	2.8	3.3	2.7	2.7	2.1	2.3	2.3	n.a.	
Barclays Basix	3.2	3.2	3.2	2.8	2.5	2.2	1.7	2.0	n.a.	
<b>Professional forecasters (2006 Q2)<sup>(g)</sup></b>	2.0	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	
<b>Financial markets (Oct. 2004)<sup>(h)</sup></b>	2.8	3.0	3.1	3.1	3.0	2.9	3.1	3.1	2.9	
<b>Five to ten year ahead expectations</b>										
<b>Households<sup>(d)</sup></b>										
Bank/GfK (2009 Q1)	n.a.	3.2	3.6	3.1	3.2	2.8	2.8	2.8	n.a.	
Barclays Basix (2008 Q3)	n.a.	3.7	3.8	3.7	3.5	3.4	2.8	3.0	n.a.	
YouGov/Citigroup (Nov. 2005)	3.5	3.3	3.5	3.0	2.9	2.7	2.6	2.7	2.7	
<b>Financial markets (Oct. 2004)<sup>(i)</sup></b>	3.0	3.5	3.5	3.4	3.3	3.1	3.3	3.4	3.3	
<b>Memo: CPI inflation</b>	1.6	2.6	2.6	1.7	1.2	0.1	0.0	0.0	n.a.	

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

(a) Data are non seasonally adjusted.

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

(c) Financial markets data are averages from 1 October to 28 October 2015. YouGov/Citigroup data are for October.

(d) The household surveys ask about expected changes in prices but do not reference a specific price index, and the measures are based on the median estimated price change.

(e) CBI data for the manufacturing, business/consumer services and distribution sectors, weighted together using nominal shares in value added. Companies are asked about the expected percentage price change over the coming twelve months in the markets in which they compete.

(f) Instantaneous RPI inflation one year ahead implied from swaps.

(g) Bank's survey of external forecasters, inflation rate three years ahead.

(h) Instantaneous RPI inflation three years ahead implied from swaps.

(i) Five-year, five-year forward RPI inflation implied from swaps.

and non-wage costs also picked up. Unit labour cost growth is estimated to have risen further in 2015 Q3, to 2.2%, but is then projected to drop back a little, to around 2%, in 2015 Q4. Beyond that, as wage growth continues to strengthen following the absorption of slack in the labour market, unit labour cost growth is projected to pick up further (Section 5).

The extent to which increases in labour costs put upward pressure on CPI inflation will depend on businesses' ability to pass them through to consumers. In Q2, indicators of domestically generated inflation remained subdued (Chart 4.7). Survey indicators of businesses' capacity utilisation rates are around, or a little above, their historical average level (Section 3), which may imply further upward pressure on businesses' costs as demand continues to grow.

## 4.4 Inflation expectations

A key determinant of the persistence of below-target inflation will be inflation expectations, and the extent to which they affect households' and companies' wage and price-setting behaviour. The MPC monitors a range of indicators to assess whether inflation expectations are well anchored.

Movements in households' short-term inflation expectations were mixed in Q3 (Table 4.B). The Barclays Basix and YouGov/Citigroup measures rose slightly, while the Bank/GfK measure fell a little. Households' short-term inflation expectations remain below their historical average. Those would, however, be expected to move closely with households' perceptions of current inflation and the near-term outlook for inflation, both of which are relatively weak. Companies' short-term inflation expectations and measures derived from financial market instruments remained a little below their past averages in Q3.

Movements in medium and longer-term measures of inflation expectations may be more informative when considering whether expectations remain well anchored. Although measures of households' longer-term expectations remained below their historical averages, some picked up in Q3 (Table 4.B). According to the Deloitte survey, however, the proportion of chief financial officers reporting that they expect inflation to be below 1½% in two years' time increased in Q3 to just under 40%, from around 30% in Q2. Professional forecasters' expectations two to three years ahead were unchanged. Medium and longer-term measures of inflation expectations derived from financial market prices fell slightly in Q3, but remained close to their past averages.

Overall, the MPC judges that inflation expectations remain well anchored. There remains a risk, however, that lower inflation expectations affect wage and price-setting behaviour, causing low inflation to be more persistent. The MPC will continue to monitor inflation expectations closely.

## The effect of imported price pressures on UK consumer prices

The openness of the UK economy means that inflation can be sensitive to movements in imported costs. These can stem from changes in both foreign export prices and the sterling exchange rate. For example, the depreciation of sterling in 2007–08 and the strength in foreign export prices between late 2009 and 2012 both contributed to the rise in inflation to well above the 2% target between late 2009 and 2013; conversely sterling's appreciation since March 2013 is a contributing factor to the current low inflation rate.

In forming its inflation projection, the MPC must make judgements on the outlook for import prices and how businesses are likely to pass those through the supply chain to CPI inflation. The outlook for import prices will, in turn, depend on how changes in foreign export prices and the sterling exchange rate are passed through. This box explains the factors driving the relationship between world export prices and UK import prices, between UK import prices and CPI inflation, and the uncertainties around those. It concludes by setting out the assumptions underlying the MPC's latest projections.

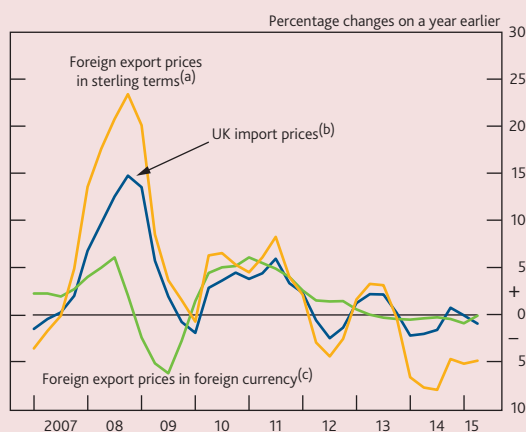
### The link from world export prices to UK import prices

In order to form a projection for non-energy UK import price inflation, the MPC takes a view on the outlook for global pricing pressures and, hence, foreign export prices. That path for foreign countries' average export prices is then converted into sterling according to the conditioning assumption for the sterling effective exchange rate (ERI), as set out in Section 5. The degree of pass-through from sterling foreign export prices to UK import prices, however, varies over time (**Chart A**).<sup>(1)</sup> On average, around 60% of past changes in the Bank's measure of sterling foreign export prices have been reflected in UK import prices, usually within a year. That is broadly consistent with estimates of exchange rate pass-through in other countries.<sup>(2)</sup> At times, such as between 2010 and 2012, when import prices moved broadly in line with sterling world export prices, the relationship has been much closer than that. At other times, including over the past year or so it appears to have been more moderate. So the MPC has to make a judgement about how much of any changes in sterling foreign export prices will be reflected in UK import prices.

A number of factors will influence the extent of pass-through from sterling foreign export prices to UK import prices. One factor is the presence of so-called 'pricing to market' effects. For many goods and services, the price foreign exporters charge is likely to differ across the countries they are selling to. A measure of aggregate foreign export prices that captures only the average price at source will not, therefore, necessarily

reflect the prices paid by UK importers. Moreover, international companies may vary the price of their exports to a particular country in response to changes in demand there. Where changes in the exchange rate are themselves driven by shifts in demand, the presence of pricing to market effects will affect the extent to which those changes are reflected in sterling import prices. For example, if strong domestic demand growth leads to an appreciation in sterling then foreign exporters may not reduce their sterling prices by as much as they could in light of the exchange rate rise. This may help to account for the relatively small falls in UK import prices since 2014 (**Chart A**).

**Chart A** The degree of pass-through from sterling foreign export prices to UK import prices varies over time  
UK import prices and foreign export prices excluding fuel



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

- (a) Domestic currency non-oil export prices of goods and services of 51 countries weighted according to their shares in UK imports, divided by the sterling effective exchange rate. The sample does not include any major oil exporters.  
 (b) As advised by the ONS in the notice released on 2 November 2015, this line shows the price index for goods excluding oil and erratics, as defined in footnote (1) on page 26, weighted together with the services import price deflator.  
 (c) Domestic currency non-oil export prices as defined in footnote (a).

UK demand for foreign goods and services will in part reflect the capacity to produce similar goods and services in the United Kingdom, and hence supply conditions here. A change in the exchange rate associated with a change in UK supply conditions may, therefore, have different effects. For example, if UK supply growth were to improve, UK businesses may be able to satisfy more domestic demand and hence demand for foreign goods and services may grow more slowly. If that improvement in supply were accompanied by an appreciation of sterling then foreign exporters may let the downward pressure on sterling import prices from the appreciation pass through more fully in an attempt to protect market share.

- (1) For further discussion about the relationship between world export prices and UK import prices see Forbes, K, Hjortsoe, I and Nenova, T (2015), 'The shocks matter: improving our estimates of exchange rate pass-through', *External MPC Unit Discussion Paper No. 43*.  
 (2) For example, Campa, J M and Goldberg, L (2005), 'Exchange-rate pass-through into import prices', *The Review of Economics and Statistics*, Vol. 87(4), pages 679–90 find an average pass-through of 64% in a study of 23 countries.

Pricing to market effects are present only for some imports, so the extent to which import prices move in line with sterling foreign export prices will depend on which export prices are changing. Commodities are highly tradable and their prices are often set in global markets. So, when changes in sterling foreign export prices are driven mainly by changes in commodity prices, they may be reflected more fully in changes in UK import prices. This may help to explain why import prices moved quite closely in line with sterling foreign export prices during 2010–13.

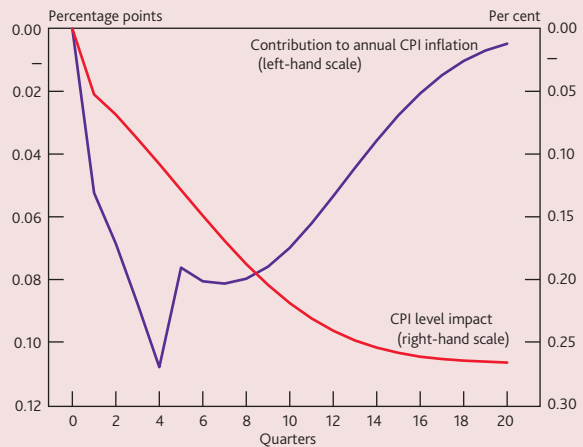
Differences between the measure of foreign export prices used and UK import prices may also affect estimates of pass-through. A measure of aggregate foreign export prices will capture the mix of goods and services that are exported globally but not necessarily the mix of goods and services imported in the United Kingdom. In addition, exporters may choose to set their prices in a currency other than their own or the market they are exporting to. For example, around 10% of UK imports come from the United States, but at least 35% of imports are invoiced in US dollars, significantly greater than the US dollar weight in the sterling ERI.<sup>(1)</sup> So a measure of foreign export prices converted using the sterling ERI may not capture the actual exchange rates relevant for UK import prices. That will be particularly relevant when there are large bilateral sterling exchange rate moves. Indeed, as the appreciation in the sterling ERI since March 2013 has reflected an appreciation against the euro but overall little change against the US dollar, this may be another reason why import prices have fallen by less than implied by the sterling ERI-based measure of foreign export prices recently.

### Pass-through of UK import prices to consumer prices

The extent to which UK import prices change in response to moves in foreign export prices or the exchange rate will vary over time, and will depend on the factors driving the change and economic conditions. In addition, the pass-through of those changes in import prices to CPI inflation is uncertain and will depend on the import content of consumption, the share of domestically produced goods that are substitutes for imports and how domestic economic conditions affect businesses' pricing decisions. Estimates of the pass-through of import prices to the CPI suggest that, on average, a 1% fall in non-energy import prices lowers the level of consumer prices by a little less than 0.3% (**Chart B**). Most of that is estimated to occur over a three-year period, with the peak impact on inflation after around a year. That appears to be broadly consistent with a full but gradual pass-through to the CPI of any change in import prices, given the share of imports in the CPI: estimates based on the 2010 ONS Supply and Use Analytical Tables suggest that non-energy imports account for a little under 30% of the CPI basket.

### Chart B A fall in import prices is likely to weigh on consumer price inflation for a protracted period

Model-based impact of a 1% change in non-energy import prices on CPI inflation<sup>(a)</sup>



(a) Results from a simulation of an unexpected shock to the sterling effective exchange rate such that import prices fall by 1%. For more information about the Bank's central forecasting model and range of supporting models see Burgess *et al* (2013), 'The Bank of England's forecasting platform: COMPASS, MAPS, EASE and the suite of models', *Bank of England Working Paper No. 471*; [www.bankofengland.co.uk/research/Documents/workingpapers/2013/wp471.pdf](http://www.bankofengland.co.uk/research/Documents/workingpapers/2013/wp471.pdf).

The extent to which, and how quickly, businesses pass through changes in import prices, and whether the prices of other goods and services adjust, will depend on a number of factors. If consumer demand were relatively robust, businesses may be quicker to pass through price increases, and slower to pass through lower prices, than they would be if demand were weak. Which goods and services prices are changing will also affect the dynamics of pass-through: goods and services that require little processing before being purchased by consumers or that have relatively few substitutes, such as food, are likely to see quicker pass-through.

### The MPC's current assumptions

There is uncertainty around the extent to which changes in foreign export prices and the sterling exchange rate will be reflected in UK consumer prices, and the time those changes will take to pass through. Taking all the evidence together, the MPC's best collective judgement is that on average around 60% of any change in sterling foreign export prices tends to be reflected in UK import prices, with pass-through completed within a year, although that will vary depending on the reason for the change. The MPC also judges that all of the change in import prices tends to be reflected in the CPI, with almost all of that change passed through within three years. The impact will depend crucially on the economic conditions at the time, and the composition of those changes.

(1) Importers are only required to specify the invoicing currency for imports from outside the EU. To the extent that some imports from within the EU are invoiced in US dollars then the overall share of the US dollar in imports could be greater.

# 5 Prospects for inflation

CPI inflation has remained close to zero. GDP growth has slowed over the past year to around its past average rate. A weaker global backdrop together with falls in the prices of risky assets are weighing on the outlook for UK growth, but they are counterbalanced by support from falls in market interest rates and commodity prices. Conditioned on a very gently rising path for Bank Rate, the MPC judges that four-quarter growth is likely to remain around current rates and the slack remaining in the economy is likely to be absorbed. Recent falls in oil and other commodity prices mean that inflation is likely to remain lower than previously expected until late 2017 but, on the conditioning path for Bank Rate, the MPC's best collective judgement is that CPI inflation will return to the 2% target in around two years and rise above it thereafter.

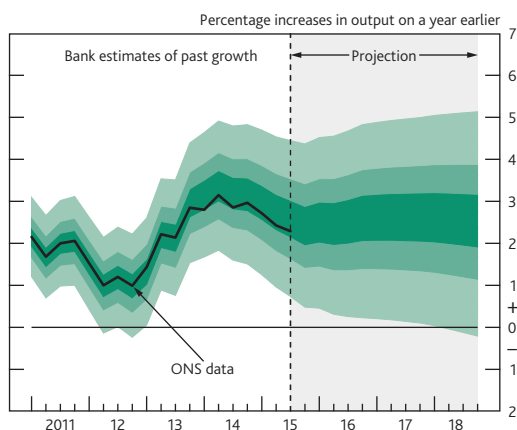
**Table 5.A** Conditioning path for Bank Rate implied by forward market interest rates<sup>(a)</sup>

Per cent	2015	2016				2017				2018			
	Q4 <sup>(b)</sup>	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
November	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.1	1.1	1.2	1.3
August	0.5	0.6	0.7	0.9	1.0	1.2	1.3	1.4	1.5	1.6	1.7	1.7	

(a) The data are fifteen working day averages of one-day forward rates to 28 October 2015 and 29 July 2015 respectively. The curve is based on overnight index swap rates.

(b) November figure for 2015 Q4 is an average of realised spot rates to 28 October 2015, and forward rates thereafter.

**Chart 5.1** GDP projection based on market interest rate expectations and £375 billion purchased assets



The fan chart depicts the probability of various outcomes for GDP growth. It has been conditioned on the assumption that the stock of purchased assets financed by the issuance of central bank reserves remains at £375 billion throughout the forecast period. 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.

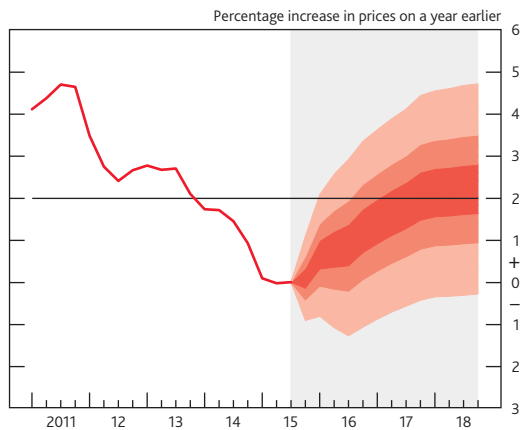
Since the *August Report*, CPI inflation has remained close to zero, largely reflecting the impact of past falls in the prices of commodities and other imported goods, but also reflecting relatively low domestic cost growth.<sup>(1)</sup> Although the slowing in UK growth over the past year was broadly in line with expectations (see the box on pages 42–43), the latest outturns have been a little weaker than anticipated three months ago. More notably, the outlook for emerging economies appears weaker.

The MPC's projections are conditioned on the asset prices prevailing in the fifteen working days to 28 October.<sup>(2)</sup> Recently, global developments have been associated with marked movements in asset prices, including those in the United Kingdom. Since the *August Report*, the path for Bank Rate implied by market rates has fallen by around 40 basis points, such that it only reaches 0.75% in 2017 Q2, compared with 2016 Q3 in August, and is just 1¼% by the end of 2018 (Table 5.A). There is uncertainty, however, about the extent to which the fall since August reflects changes in market participants' expectations about the most likely path for Bank Rate: some of the fall in market yields may reflect increased concerns about downside risks. The sterling ERI has

(1) The reasons why inflation remains well below the 2% target and the MPC's response are set out in the Governor's letter to the Chancellor; [www.bankofengland.co.uk/monetarypolicy/Documents/pdf/cpiletter051115.pdf](http://www.bankofengland.co.uk/monetarypolicy/Documents/pdf/cpiletter051115.pdf).

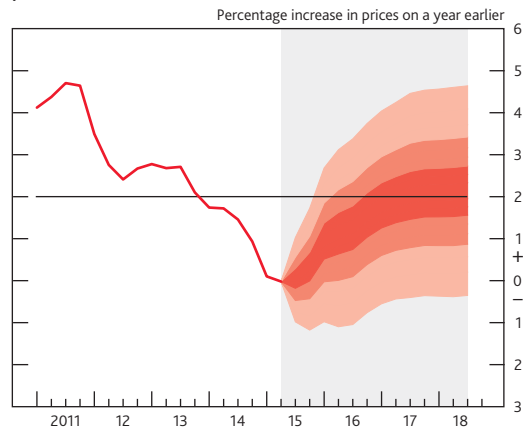
(2) Unless otherwise stated, the projections shown in this section are conditioned on: Bank Rate following a path implied by market yields; a constant stock of asset purchases; the Recommendations of the Financial Policy Committee and the current regulatory plans of the Prudential Regulation Authority; the Government's tax and spending plans as set out in the *Summer Budget 2015*; commodity prices following market paths; and the sterling exchange rate remaining broadly stable. The main assumptions are set out in a table at [www.bankofengland.co.uk/publications/Documents/inflationreport/2015/novca.pdf](http://www.bankofengland.co.uk/publications/Documents/inflationreport/2015/novca.pdf). In the days after the MPC finalised its projections the market-implied path for UK interest rates rose by around 15 basis points, reversing part of the fall since August. The sterling ERI prevailing immediately before the MPC's decision was nearly 2% higher than the rate used in these projections.

**Chart 5.2** CPI inflation projection based on market interest rate expectations and £375 billion purchased assets

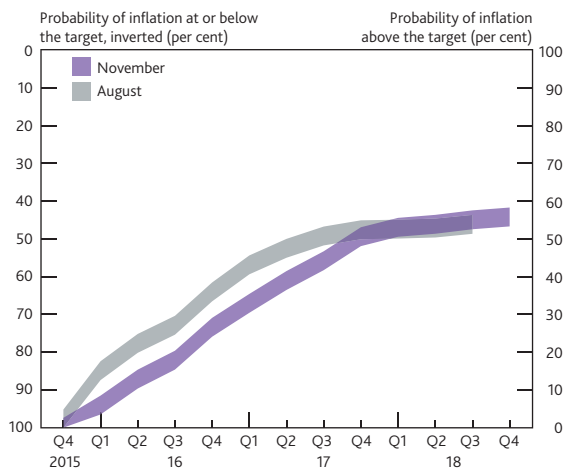


Charts 5.2 and 5.3 depict the probability of various outcomes for CPI inflation in the future. They have been conditioned on the assumption that the stock of purchased assets financed by the issuance of central bank reserves remains at £375 billion throughout the forecast period. If economic circumstances 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 and £375 billion purchased assets



**Chart 5.4** 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.

fallen by 2% and the FTSE All-Share is 4% lower, largely reflecting global influences (Section 1).

By themselves, weaker global activity and associated falls in risky asset prices are expected to weigh on the outlook for UK GDP and inflation, but a lower level of sterling and the lower path for Bank Rate support it. The MPC's latest projections for growth and inflation (Charts 5.1 and 5.2) are therefore broadly similar to those in the *August Report* in the medium term, although inflation is a little higher by the three-year point (Chart 5.4).

Under the conditioning assumptions of a very gradual rise in Bank Rate and that the stock of purchased assets remains at £375 billion, UK private domestic demand grows at above-average rates, such that four-quarter GDP growth remains around 2½% over the forecast period, despite below-average global growth and the continuing fiscal consolidation. GDP is judged likely to grow slightly faster than the economy's supply capacity so the remaining slack in the economy is absorbed and a small margin of excess demand opens up. CPI inflation is likely to remain below 1% until the second half of 2016, however, reflecting the continuing drag from commodity and other imported goods prices. Thereafter, that drag dissipates and, conditioned on the market path, building domestic cost pressures are projected to take CPI inflation back to the 2% target in the second half of 2017 and above it in 2018 (Chart 5.4). Considerable uncertainty surrounds these projections. As in August, the risks to the GDP outlook are weighted to the downside, reflecting risks from the rest of the world. In part reflecting those downside risks to global activity, there is a downside skew to the CPI inflation projection in the first two years, albeit diminishing in the second year, but the risks are judged to be broadly balanced by the three-year horizon.

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

**Key Judgement 1: global growth remains well below past average rates as emerging-economy growth recovers only a little from current weak rates and advanced-economy growth remains modest**

	Average 1998– 2007	Projections			
		2015	2016	2017	2018
World GDP (UK-weighted) <sup>(c)</sup>	3	2¼ (2¼)	2¼ (2¾)	2½ (2¾)	2¼
World GDP (PPP-weighted) <sup>(d)</sup>	4	3 (3¼)	3¼ (3¾)	3¼ (3½)	3¼
Euro-area GDP <sup>(e)</sup>	2¼	1½ (1½)	1¾ (1¾)	1¾ (1¾)	1½
US GDP <sup>(f)</sup>	3	2½ (2½)	2½ (2¾)	2¼ (2¼)	2
Dollar oil prices <sup>(g)</sup>	39	49 (57)	56 (62)	59 (66)	62

**Key Judgement 2: domestically, productivity growth supports supply as the growth in labour supply slows**

	Average 1998– 2007	Projections			
		2015	2016	2017	2018
Productivity <sup>(h)</sup>	2¼	1¼ (1)	1 (1)	1½ (1½)	1¾
Participation rate <sup>(i)</sup>	63	63½ (63½)	63½ (63½)	63½ (63½)	63½
Average hours <sup>(j)</sup>	32¼	32 (32¼)	32¼ (32½)	32¼ (32¼)	32¼

**Key Judgement 3: UK private demand remains resilient in the face of developments abroad and the continuing fiscal consolidation at home**

	Average 1998– 2007	Projections			
		2015	2016	2017	2018
Credit spreads <sup>(k)</sup>	¾ (l)	2¼ (2)	2 (2)	2 (2)	2
Household saving ratio <sup>(m)</sup>	8¾	4¾ (5¼)	4 (5)	3¼ (4½)	2¾
Business investment to GDP ratio <sup>(n)</sup>	9¾	9¾ (10¾)	10¼ (11¼)	10¾ (12)	11¼

**Key Judgement 4: the drag on CPI inflation from external factors gradually dissipates and wage and domestic cost growth strengthen**

	Average 1998– 2007	Projections			
		2015	2016	2017	2018
UK import prices <sup>(o)</sup>	¼	-4¾ (-5½)	¾ (¾)	1 (¾)	1
Unit labour costs <sup>(p)</sup>	3	2 (2)	2¾ (3)	2¾ (3)	2¾

Sources: Bank of England, BDRG Continental *SME Finance Monitor*, Bloomberg, BofA Merrill Lynch Global Research, British Household Panel Survey, Department for Business, Innovation and Skills, 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 2015 *Inflation Report*, which were only available to 2017.
- (c) Chained-volume measure. Constructed using real GDP growth rates of 146 countries weighted according to their shares in UK exports.
- (d) Chained-volume measure. Constructed using real GDP growth rates of 147 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) Average level in Q4. Dollars per barrel. Projection based on monthly Brent futures prices.
- (h) GDP per hour worked. GDP at market prices is based on the mode of the MPC's backcast. Hours worked are based on Bank staff's assumption for population growth, as explained in the May 2015 *Report*.
- (i) Level in Q4. Percentage of the 16+ population.
- (j) Level in Q4. Average weekly hours worked, in main job and second job.
- (k) 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.
- (l) 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.
- (m) Calendar-year average. Percentage of total available household resources.
- (n) Calendar-year average. Chained-volume business investment as a percentage of GDP.
- (o) Four-quarter inflation rate in Q4. Excludes the impact of missing trader intra-community fraud.
- (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.

In light of the economic outlook, at its meeting ending on 4 November the MPC voted to maintain Bank Rate at 0.5% and the stock of purchased assets at £375 billion. The factors behind that decision are set out in the Monetary Policy Summary on pages i–ii of this *Report*, and in more detail in the minutes of the meeting.<sup>(1)</sup> A box on page 34 sets out the MPC's current expectations about the stock of purchased assets as Bank Rate rises.

## 5.1 Key judgements and risks

The shape of the Committee's projections reflects four key judgements and the risks around them. **Table 5.B** provides projections for variables that illustrate those judgements; **Table 5.C** provides a range of indicators to monitor them; and **Table 5.D** shows indicative projections for a range of other variables.

**Key Judgement 1: global growth remains well below past average rates as emerging-economy growth recovers only a little from current weak rates and advanced-economy growth remains modest**

Having supported global activity in the aftermath of the financial crisis, growth in emerging economies has weakened in recent years and has consistently undershot projections. In China, concerns about growth prompted the authorities to introduce further policy stimulus, including increased fiscal spending and cuts in official interest rates. In part reflecting past policy actions, the official estimate of annual growth in China remained robust in Q3, albeit lower than seen in recent years, at 6.9%. In the central projection, growth slows a little more than assumed in August, to around 6%. In addition, emerging economies other than China are projected to grow by less than 3% in 2015, down from around 6% in 2010, with output having fallen materially in some countries where global headwinds have been exacerbated by domestic challenges, including Brazil and Russia. Further out, growth is judged likely to recover slowly, but the pattern of relatively weak growth over several years has led the Committee to reappraise the medium-term growth rates for these economies, which are now projected to be lower than in previous *Reports*.

Revisions to the outlook for emerging economies by themselves account for the majority of the downgrade to world growth relative to three months ago. The weakness in emerging economies also has implications for advanced economies through both trade and financial channels. Risk-free rates have fallen in advanced economies, helping support activity. Although those falls by themselves would tend to push up the prices of risky assets, equity prices are lower and corporate bond yields higher than three months ago, weighing on growth.

(1) The minutes are available at [www.bankofengland.co.uk/publications/minutes/Documents/mpc/pdf/2015/nov.pdf](http://www.bankofengland.co.uk/publications/minutes/Documents/mpc/pdf/2015/nov.pdf).



## Table 5.C Monitoring risks to the Committee's key judgements

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

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

Key judgement	Likely developments in 2015 Q4 to 2016 Q2 if judgements evolve as expected
<b>1: global growth remains well below past average rates as emerging-economy growth recovers only a little from current weak rates and advanced-economy growth remains modest</b>	<ul style="list-style-type: none"> <li>• Quarterly euro-area growth to average a little below ½%.</li> <li>• Euro-area HICP inflation is expected to pick up in the coming months, and to average around 1% in 2016 H1.</li> <li>• Quarterly US GDP growth to average a little above ½%.</li> <li>• US PCE inflation remains weak in the coming months, but picks up to around 1¼% in 2016 H1.</li> <li>• Indicators of activity consistent with four-quarter PPP-weighted emerging-economy growth of around 4%; within that, Chinese GDP growth to average around 6½%.</li> </ul>
<b>2: domestically, productivity growth supports supply as the growth in labour supply slows</b>	<ul style="list-style-type: none"> <li>• Participation rate to pick up slightly by the middle of next year to a little under 63½%.</li> <li>• Headline LFS unemployment to fall slightly to 5.3% by the middle of next year.</li> <li>• Average hours to increase by around ½% by the middle of next year.</li> <li>• Quarterly hourly labour productivity to grow at an average pace of slightly below ¼%.</li> <li>• Indicators of capacity utilisation within firms to ease back slightly by the middle of next year.</li> </ul>
<b>3: UK private demand remains resilient in the face of developments abroad and the continuing fiscal consolidation at home</b>	<ul style="list-style-type: none"> <li>• Quarterly consumption growth of around ¾%.</li> <li>• Saving ratio of around 3¾% by 2016 Q2.</li> <li>• Quarterly business investment growth to average above 1½%.</li> <li>• Credit spreads rise slightly in 2015 Q4, and then fall back.</li> <li>• A rise in mortgage approvals for house purchase to 74,000 a month, on average, in 2016 Q1.</li> <li>• Rates of increase in the main indices of national house prices to average around ½% per month.</li> <li>• Quarterly housing investment growth to average around 1%.</li> </ul>
<b>4: the drag on CPI inflation from external factors gradually dissipates and wage and domestic cost growth strengthen</b>	<ul style="list-style-type: none"> <li>• Commodity prices and sterling ERI to evolve in line with the conditioning assumptions set out in <a href="http://www.bankofengland.co.uk/publications/Documents/inflationreport/2015/novca.pdf">www.bankofengland.co.uk/publications/Documents/inflationreport/2015/novca.pdf</a>.</li> <li>• Domestic gas prices to fall by 5% by next spring. Domestic electricity prices to remain flat.</li> <li>• Four-quarter AWE growth to temporarily dip to 2½% in Q4 due to volatility in bonuses a year earlier, before picking up to 3¼% by the middle of next year.</li> <li>• Four-quarter growth in whole-economy unit labour costs to reach 2¼% by Q1 next year.</li> <li>• Import prices expected to remain little changed in 2016 H1.</li> <li>• Indicators of inflation expectations continue to be broadly consistent with the 2% target.</li> </ul>

Commodity prices have also fallen. Since the *August Report*, the price of Brent crude oil has declined by 14%, to US\$48 a barrel. While that appears to reflect weaker demand prospects, particularly in emerging economies, it should support real income and hence spending in commodity-importing countries, including in some advanced economies.

Taken together the net effect on advanced economies of emerging-economy weakness is judged to be broadly neutral: the growth outlooks in the euro area and United States are little changed (**Table 5.B**). In the euro area, annual growth has picked up in 2015 and is projected to remain close to 1½%, supported by lower energy prices, improvements in credit conditions, the ECB's asset purchase programme and the past depreciation of the euro. Growth remains below past average

## The MPC's asset purchases as Bank Rate rises

After cutting Bank Rate to 0.5% during 2008–09, the MPC loosened monetary policy further by conducting a total of £375 billion of asset purchases during 2009–12. Since then, the MPC has maintained Bank Rate at 0.5% and the stock of purchased assets at £375 billion by reinvesting in new assets the cash flows associated with maturing assets. And in February 2014, the MPC also provided guidance that, given the likely persistence of the headwinds restraining economic growth following the financial crisis, when the MPC does begin to raise Bank Rate it expects to do so gradually and to a lower level than in previous cycles.

The date at which the MPC judges it appropriate to adjust the stance of monetary policy will depend on the outlook for inflation in the United Kingdom. As and when the time comes for a tightening of monetary policy, the MPC will have two tools it could use: the Committee will be able to tighten monetary policy either by raising Bank Rate or by reducing the stock of purchased assets.

As set out in the box on page 41 of the May 2014 *Report*, **the MPC's preference is to use Bank Rate as the active marginal instrument for monetary policy**, given its greater flexibility as a policy tool. Given that preference, and in order to have the scope to adjust policy sufficiently in either direction should that be required, **the MPC expects to maintain the stock of purchased assets at £375 billion until Bank Rate has reached**

**a level from which it can be cut materially.** The MPC views sales and reinvestment decisions as equivalent from a monetary policy perspective. The Committee therefore expects to continue to reinvest maturing assets until Bank Rate has reached such a level.

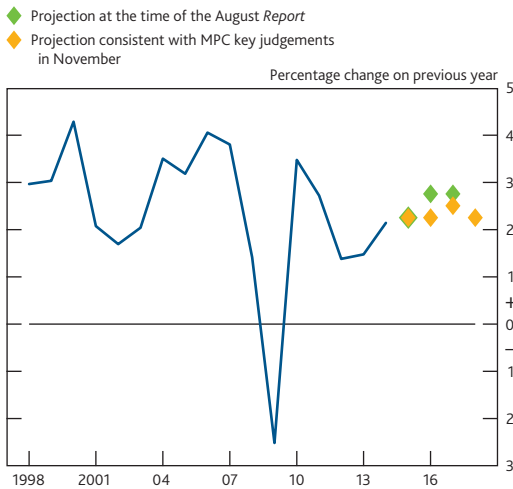
The level of Bank Rate that would give the MPC sufficient scope to cut it materially, should that be necessary, depends on a range of factors that are likely to vary over time. Those include the likely size of the shocks to which the economy is exposed and the likely impact of policy changes. **Based on historical experiences, the MPC currently judges that such a level of Bank Rate is around 2%.** It follows that the MPC's current expectation is that it is unlikely to reduce the stock of purchased assets from its current level of £375 billion until Bank Rate is around 2%. Decisions about the stock of purchased assets will, however, reflect the economic circumstances at the time.

Any reduction in the stock of purchased assets will be conducted in an orderly manner over a period of time so as not to disrupt the gilt market. So, while any reduction will be solely a decision for the MPC based on meeting its objectives, the Bank will liaise with the Debt Management Office when implementing any change in its asset purchase programme.

The MPC will continue to monitor the factors affecting these judgements and will revisit them accordingly.

rates, however, reflecting the continuing challenge of reducing debt and weaker potential growth, in part due to demographic trends in some countries. In the United States, inflation has remained low, largely reflecting lower prices for energy, food and other goods. GDP growth appears to have been a little stronger in the first half of 2015 than previously thought, but indicators for the second half of the year have softened. Four-quarter growth is projected to remain below past average rates (**Table 5.B**) assuming the federal funds rate follows the path implied by market interest rates that rises from 2016 Q2.

Despite emerging economies' relatively low share in UK exports, the revisions to growth are large enough to have lowered UK-weighted world growth relative to expectations three months ago. Annual UK-weighted world growth remains around 2¼% in 2015, rising to 2½% in 2017, well below past average rates (**Chart 5.5**). Moreover, the risks to that projection continue to lie to the downside. There remain risks from China as the authorities attempt to rebalance demand towards domestic consumption and liberalise the financial system. As discussed in a box on page 2, a sharper slowdown in China would weigh on UK growth through trade,

**Chart 5.5** World GDP (UK-weighted)<sup>(a)</sup>

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

(a) Calendar-year growth rates. Chained-volume measure. Constructed using real GDP growth rates of 146 countries weighted according to their shares in UK exports. Projections were only available to 2017 at the time of the August Report.

confidence and financial market channels, although these could be partly offset by any associated falls in commodity prices. More broadly, many emerging economies remain under strain, not least in the face of prospective rises in US interest rates, which could lead to further capital outflows from some countries and increased costs of servicing dollar-denominated debt. Those downside risks to the global outlook feed through to a downside skew to the UK growth outlook over the three years of the forecast period, and a downside skew to inflation in the first two years.

Below-average global growth, together with the rise in the sterling exchange rate since 2013, means that UK export growth is projected to remain well below past average rates (Table 5.D). Import growth is a little stronger (Table 5.D), such that net trade subtracts around  $\frac{1}{2}$  percentage point from annual growth on average over the forecast period. The contrast between external and domestic demand is also apparent in the current account deficit: within that, the trade deficit is assumed to reverse its recent narrowing and the income balance to remain in significant deficit.

### Key Judgement 2: domestically, productivity growth supports supply as the growth in labour supply slows

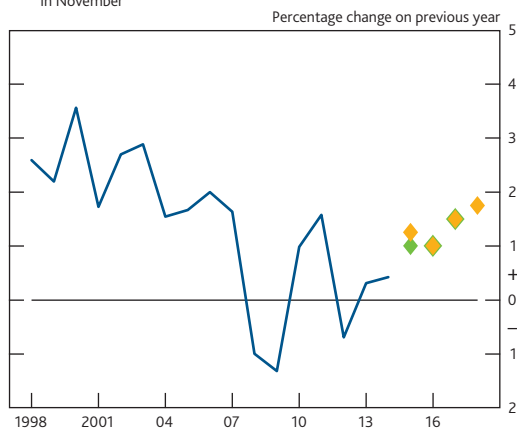
Over the past few years UK demand is judged to have grown faster than potential supply, reducing the degree of slack in the economy. The MPC's best collective judgement is that spare capacity of around  $\frac{1}{2}\%$  of GDP remains, although there is a wide degree of uncertainty around that estimate and a range of views on the Committee. With limited slack remaining, the extent to which demand can grow without generating inflationary pressures will depend on how quickly supply capacity expands and how rapidly any pressure on supply feeds into wage and price inflation.

Potential supply growth in recent years has been disproportionately accounted for by an expansion in the supply of labour. That in part reflected a shift towards longer working hours, as well as a decline in the medium-term equilibrium unemployment rate (Section 3). Over the forecast period, medium-term equilibrium average hours, unemployment and participation are assumed to change little, so underlying growth in labour supply returns to more normal rates.

By contrast, growth in output per hour worked — productivity — has been subdued during most of the post-crisis period. Over the past year or so, however, productivity growth has picked up: output per hour rose  $1\frac{1}{2}\%$  in the year to Q2. Some of that recent strength is judged to be temporary: productivity has repeatedly surprised to the downside and surveys currently suggest that companies are working slightly above normal capacity and that they expect to expand recruitment further to meet demand, consistent with a temporary boost to productivity. Annual productivity growth

**Chart 5.6 Productivity<sup>(a)</sup>**

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



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. Hours worked are based on Bank staff's assumption for population growth, as explained in the May 2015 Report. Projections were only available to 2017 at the time of the August Report.

therefore slows a little in the near term, as companies expand capacity to meet demand, before rising to 1¾% by the end of the forecast period (Chart 5.6).

The outlook for supply remains uncertain. Labour supply could grow more slowly. In recent quarters there have been signs that people's desired working hours are falling back, perhaps because real incomes have strengthened. If that trend continues it would, by itself, suggest slightly weaker supply growth. That could be offset, however, if more of the recent strength in productivity is structural rather than cyclical. Overall, the risks around the profile for potential supply growth are judged to be broadly balanced.

### Key Judgement 3: UK private demand remains resilient in the face of developments abroad and the continuing fiscal consolidation at home

Private final domestic demand has grown by 3% over the past year; within that consumption growth has strengthened while investment growth has softened (Section 2). Given the weak global backdrop, domestic spending will depend in large part on the prospects for domestic income. In 2015, households' real income is projected to grow by 3% (Table 5.D), the strongest annual rate since 2007. Over the forecast, the projected strengthening in underlying productivity growth, past reductions in labour market slack and recent falls in commodity prices mean real incomes are projected to grow faster over the next three years than over the past three, although at only 2¼%, below past average rates, due to modest productivity growth and the fiscal consolidation. Households' and companies' spending will also depend on factors such as economic uncertainty, credit conditions and financial wealth, all of which may be affected by external events.

Measures of uncertainty have fallen back materially since the height of the financial crisis. Since the August Report, however, there are signs that uncertainty may have risen a little (Section 2). The central projection therefore builds in a small near-term drag on domestic demand from greater uncertainty, as some companies put investment plans on hold and some households delay purchases. That is assumed to be short-lived although uncertainty could weigh on spending for longer.

Recently there has been a small widening in banks' funding spreads (Section 1), which would tend to push up the cost of borrowing. There have also, however, been signs of intensifying competition among lenders apparent, for example, in a narrowing gap between rates on high and low loan to value mortgages. The net of these means that the MPC's November projections are conditioned on only slightly wider credit spreads this year than three months ago and broadly similar spreads further out (Table 5.B). Overall, past improvements in credit conditions, as seen in sharp falls in

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

	Average 1998– 2007	Projections			
		2015	2016	2017	2018
Household consumption <sup>(b)</sup>	3¾	3 (3¾)	3 (3¾)	3 (3)	2¾
Business investment <sup>(c)</sup>	2½	5½ (4¾)	7½ (7¼)	8¾ (8½)	7¾
Housing investment <sup>(d)</sup>	3½	¼ (6½)	4½ (4½)	5¾ (4)	4¾
Exports <sup>(e)</sup>	4½	3¾ (5½)	2½ (2½)	1¾ (2½)	2½
Imports <sup>(f)</sup>	6	3 (4)	3¾ (3¾)	3¾ (4)	3¼
Real post-tax household income <sup>(g)</sup>	3	3 (2½)	2¼ (3)	2¼ (2½)	2¼
Employment <sup>(h)</sup>	1	1½ (1¼)	1 (1¼)	1 (1)	¾
Average weekly earnings <sup>(i)</sup>	4¼	2½ (3)	3¾ (3¾)	4 (4¼)	4¼

(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 2015 *Inflation Report*, which were only available to 2017.

(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. Official MTIC-adjusted data are not available for exports, so headline exports data have been adjusted by Bank staff for MTIC fraud by an amount equal to the ONS import adjustment.

(f) Chained-volume measure. The historical data exclude the impact of MTIC fraud.

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

(h) Four-quarter growth rate in Q4. Data have been adjusted for Bank staff's assumption for population growth as explained in the May 2015 *Report*.

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

mortgage rates to historically low levels (Section 2), continue to support consumption and housing investment growth throughout the projection. Funding costs and hence loan rates are likely to remain sensitive to global developments.

The outlook for domestic demand also depends on financial conditions more broadly. In the central projection, the path for Bank Rate rises very gradually, and is significantly lower than three months ago, suggesting more support to spending. Acting in the other direction, however, the prices of risky assets have fallen, reducing household wealth and increasing the cost of capital. Taking these together, there is judged to be only a little more support to spending from wealth and interest rates than assumed three months ago.

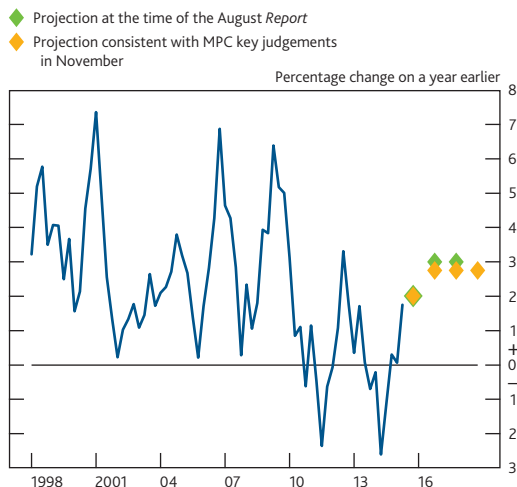
Taking all the influences on domestic spending together, the outlook is broadly similar to that in August. In the central projection, four-quarter private final domestic demand growth picks up to around 4%, above pre-crisis average rates, before slowing to around 3½% by the end of the forecast period. Within that, household consumption grows at around 3% (Table 5.D) funded through both income growth and a continuing fall in saving. The household saving ratio falls to just under 3% in 2018 from its currently estimated rate of 4¾% in 2015 Q2. Housing investment grows at around 5% a year (Table 5.D), as house building expands and housing transactions continue to recover. Annual house price inflation is projected to rise slightly in the near term before dropping back to 6%. Business investment grows strongly, with four-quarter growth peaking at over 9% in the middle of the forecast period before easing back (Table 5.D) so investment growth is weaker than in August in the third year of the projection. As in August, overall domestic demand grows more slowly than private demand, given the continuing fiscal consolidation.

The overall risks to the domestic spending profile are judged to be broadly balanced. The path for income and hence domestic spending will depend in large part on developments in productivity (Key Judgement 2). On the downside, households may be unwilling to reduce saving to the extent assumed in the central case, even if Bank Rate follows the market path. The risks to business investment may lie to the upside: the level of investment is lower than in August, largely reflecting downward revisions in the data (Section 2). There is a range of views on the Committee around the outlook for domestic spending and the risks around it.

#### **Key Judgement 4: the drag on CPI inflation from external factors gradually dissipates and wage and domestic cost growth strengthen**

The recent weakness in inflation has largely reflected persistent downward pressure from commodity prices, world export prices and the sterling exchange rate. Since August, commodity prices have fallen further but a lower sterling ERI is

**Chart 5.7 Unit labour costs<sup>(a)</sup>**



Sources: ONS and Bank calculations.

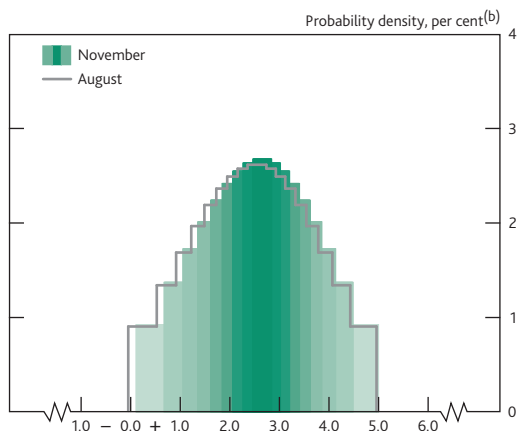
(a) Whole-economy total labour costs divided by GDP at market prices, based on the mode of the MPC's GDP backcast. Total labour costs comprise compensation of employees and the labour share multiplied by mixed income. The chart shows data to 2015 Q2 and projections for four-quarter growth in Q4 thereafter. Projections were only available to 2017 at the time of the August Report.

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

	Mode	Median	Mean
2015 <sup>(b)</sup>	2.7 (2.8)	2.7 (2.8)	2.7 (2.8)
2016	2.5 (2.7)	2.5 (2.6)	2.5 (2.6)
2017	2.7 (2.6)	2.6 (2.5)	2.6 (2.5)
2018	2.6	2.5	2.5

(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 *Inflation Report*, which were only available to 2017. The November and August projections have been conditioned on market interest rates, and the assumption that the stock of purchased assets financed by the issuance of central bank reserves remains at £375 billion throughout the forecast period.  
 (b) The anticipated revisions to recent estimates of quarterly GDP growth have implications for calendar-year growth in 2015. Without the anticipated revisions to past GDP growth, the modal path of the Committee's November projections would imply calendar-year growth of 2.4% in 2015 rather than 2.7%.

**Chart 5.8 Projected probabilities of GDP growth in 2017 Q4 (central 90% of the distribution)<sup>(a)</sup>**



(a) Chart 5.8 represents the cross-section of the GDP growth fan chart in 2017 Q4 for the market interest rate projection. It has been conditioned on the assumption that the stock of purchased assets remains at £375 billion throughout the forecast period. 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. The grey outline represents the corresponding cross-section of the August 2015 *Inflation Report* fan chart, which was conditioned on market interest rates and the same assumption about the stock of purchased assets financed by the issuance of central bank reserves.  
 (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.

likely to support import prices. Lower oil prices, together with slightly weaker-than-expected outturns for CPI inflation since August (Section 4), have reduced the near-term profile for inflation by around ¼ percentage point. Moreover, falls in the gas futures curve mean that small cuts to domestic energy bills are expected not only in the near term, as assumed in August, but also later in 2016. It now seems more likely than not that inflation will remain below 1% until the second half of 2016, much later than judged likely when inflation first fell below 1% at the start of 2015. That further revision illustrates the risks to UK inflation from movements in commodity prices.

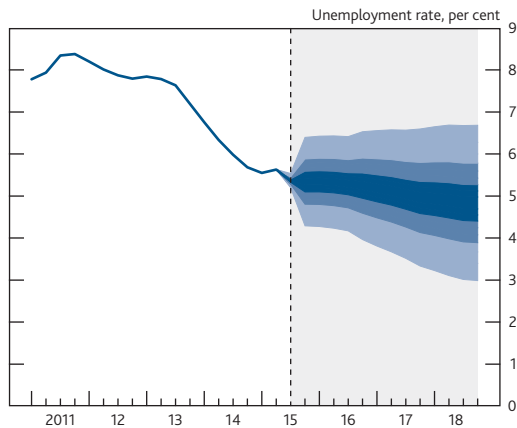
Since August, the sterling ERI has fallen by 2%, taking it close to its level in the spring. That pushes up import prices (Table 5.B), but overall, import prices are still dragging on CPI inflation for much of the forecast period. The dampening impact of the appreciation of sterling that began in Spring 2013 is expected to diminish only gradually over the MPC's forecast period and is still likely to be affecting inflation in two years' time. There remains considerable uncertainty about how much and how quickly moves in the exchange rate feed through to CPI inflation: a box on pages 28–29 sets out the MPC's latest assumptions.

In the central projection, as external pressures fade, CPI inflation is projected to pick up over the next year or so. That relies on there being few spillovers from the period of low inflation. Some measures of inflation expectations, especially those of households, remain below past averages and the latest *Deloitte CFO Survey* suggested a shift down in the distribution of large companies' expectations (Section 4). Measures derived from financial market prices five years ahead remain close to their past averages. In the MPC's projections, inflation expectations are assumed to remain well anchored.

The medium-term projection for inflation also rests on the path for domestic cost growth and in particular labour costs. Wage growth has picked up over the past year — reflecting the past reduction in labour market slack and the rise in productivity growth — but it remains below past average rates. Unit labour cost growth, which adjusts for productivity, remains below rates consistent with meeting the inflation target in a sustainable manner. The speed at which labour costs rise will depend on how easily companies can attract and retain suitable staff in a tightening labour market. A recent survey by the Bank's Agents suggested that companies are finding it harder to recruit and keep staff. That was likely to put upward pressure on the pay for some individuals and in some sectors, although not yet across the board.

In the central projection, demand grows slightly faster than supply capacity, unemployment falls a little below 5%, its estimated long-run equilibrium rate, and cost pressures build further. By the end of the forecast period, annual pay growth

**Chart 5.9** Unemployment projection based on market interest rate expectations and £375 billion purchased assets



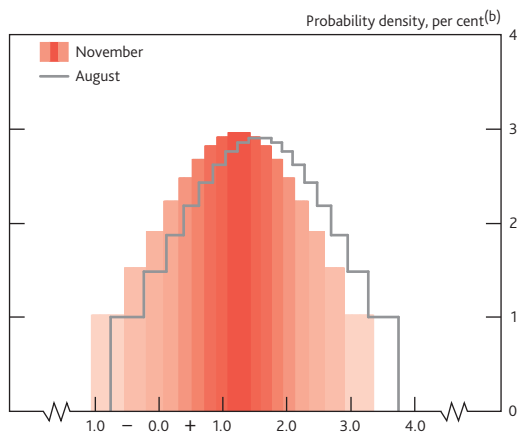
The fan chart depicts the probability of various outcomes for LFS unemployment. It has been conditioned on the assumption that the stock of purchased assets financed by the issuance of central bank reserves remains at £375 billion throughout the forecast period. The coloured bands have the same interpretation as in Chart 5.2, and portray 90% of the probability distribution. The calibration of this fan chart takes account of the likely path dependency of the economy, where, for example, it is judged that shocks to unemployment in one quarter will continue to have some effect on unemployment in successive quarters. The fan begins in 2015 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 5.4% in the three months to August, and is projected to be 5.4% in Q3 as a whole. In the later part of the forecast period, 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.F** Q4 CPI inflation

	Mode	Median	Mean
2015 Q4	0.1(0.4)	0.1(0.3)	0.1(0.3)
2016 Q4	1.2(1.6)	1.2(1.5)	1.1(1.5)
2017 Q4	2.1(2.1)	2.0(2.1)	2.0(2.1)
2018 Q4	2.2	2.2	2.2

The table shows projections for Q4 four-quarter CPI inflation. The figures in parentheses show the corresponding projections in the August *Inflation Report*, which were only available to 2017. The November and August projections have been conditioned on market interest rates, and the assumption that the stock of purchased assets financed by the issuance of central bank reserves remains at £375 billion throughout the forecast period.

**Chart 5.10** Projected probabilities of CPI inflation in 2016 Q4 (central 90% of the distribution)<sup>(a)</sup>



(a) Chart 5.10 represents the cross-section of the CPI inflation fan chart in 2016 Q4 for the market interest rate projection. It has been conditioned on the assumption that the stock of purchased assets remains at £375 billion throughout the forecast period. The coloured bands in Chart 5.10 have a similar interpretation to those on the fan charts. Like the fan charts, they portray the central 90% of the probability distribution. The grey outline represents the corresponding cross-section of the August 2015 *Inflation Report* fan chart, which was conditioned on market interest rates and the same assumption about the stock of purchased assets.

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

reaches 4¼% (Table 5.D). That pickup in pay in part reflects the strengthening in productivity but unit cost growth is projected to reach 2¾% (Chart 5.7), around its average rate. There are risks around those paths in both directions. On the downside, the period of low inflation may be reflected in weaker wage pressures, especially in the near term. On the upside, the tightening in the labour market could result in greater pressure on pay as companies find it increasingly difficult to source suitable staff.

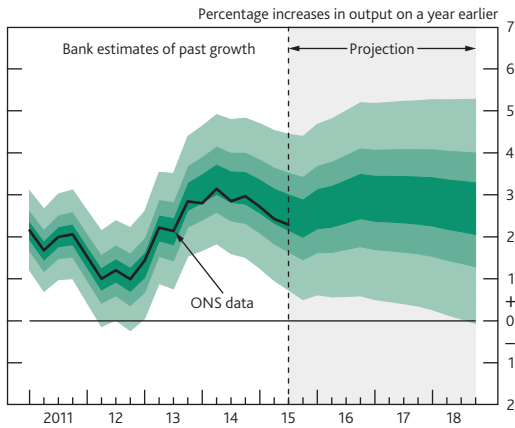
## 5.2 The projections for demand, unemployment and inflation

Based on these judgements and the risks around them, and under the conditioning path for Bank Rate based on market yields, which rises to 1.3% by 2018 Q4, the Committee judges that four-quarter GDP growth is likely to remain around 2½% (Table 5.E). Over the forecast period, conditioned on that very gradually rising path for Bank Rate, growth is supported by robust private spending, particularly housing and business investment, against a very modest global backdrop and a further fiscal consolidation. The MPC judges the risks to the projection to be weighted moderately to the downside throughout the forecast period (Chart 5.8), reflecting the possibility of an even weaker global outlook. Overall, the projection is broadly similar to that of three months ago, as a weaker outlook for emerging economies and the associated drag from falls in asset prices has been offset by the lower path for Bank Rate and the sterling ERI.

The MPC's projections are underpinned by a sustained return closer to pre-crisis rates of productivity growth. That is associated with slowing employment growth and a modest further fall in unemployment to below the assumed longer-term equilibrium rate of around 5% (Chart 5.9). Overall, slack is projected to be absorbed and a small margin of excess demand to open up by the end of the forecast period. There remains considerable uncertainty, and a range of views among MPC members, about the current degree of slack and how quickly it is likely to be absorbed.

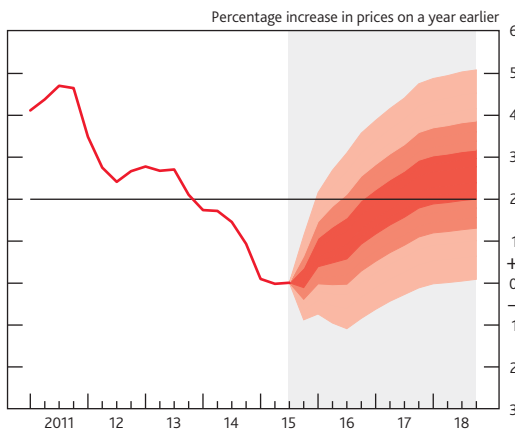
CPI inflation is judged likely to remain close to zero in the near term, before rising around the turn of the year as past falls in energy prices drop out of the annual comparison and core inflation strengthens. In the MPC's best collective judgement, inflation is expected to rise gradually thereafter, reaching the 2% target in around two years and then rising above it (Table 5.F). That gradual rise reflects building domestic cost pressures and the waning drag from the past appreciation of sterling, but there remains uncertainty around both those factors. Overall, the projection is lower than that three months ago until late 2017 (Chart 5.4), largely reflecting falls in energy prices, and a touch higher further out. The MPC judges that the risks to the projection lie to the downside in

**Chart 5.11** GDP projection based on constant nominal interest rates at 0.5% and £375 billion purchased assets



See footnote to Chart 5.1.

**Chart 5.12** CPI inflation projection based on constant nominal interest rates at 0.5% and £375 billion purchased assets



See footnote to Chart 5.2.

the first two years (**Chart 5.10**): inflation may prove to be more persistently weak than assumed in the near term and the downside risks to activity also imply downside risks to inflation. The mean projection, which takes into account the balance of risks, is therefore at the target at the two-year point, as it was in August, and above it in year three.

**Charts 5.11** and **5.12** show the MPC's projections under the alternative assumption that Bank Rate remains at 0.5% throughout the forecast period.<sup>(1)</sup> On that path, growth and inflation are higher than the market rate profiles, although the level of output and inflation are lower than in the August constant rate projections.

(1) The constant rate projections in this *Report* assume that Bank Rate is 0.5% for the next three years, and then rises towards the market path over the next three years; that path is anticipated by businesses and households.



## Other forecasters' expectations

Every three months, the Bank asks a sample of external forecasters for their latest economic projections. This box reports the results of the most recent survey, carried out in October.<sup>(1)</sup> On average, respondents expected four-quarter GDP growth to remain at 2.3% throughout the next three years (Table 1), a touch weaker than forecasters' expectations at the time of the *August Report*. The range of forecasters' two year ahead expectations of GDP growth stood at its widest for over three years (Chart A).

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

	2016 Q4	2017 Q4	2018 Q4
CPI inflation <sup>(b)</sup>	1.6	2.0	2.1
GDP growth <sup>(c)</sup>	2.3	2.3	2.3
LFS unemployment rate	5.2	5.0	4.9
Bank Rate (per cent)	1.1	1.7	2.3
Stock of purchased assets (£ billions) <sup>(d)</sup>	370	350	323
Sterling ERI	91.6	89.8	87.8

Source: Projections of outside forecasters as of 29 October 2015.

(a) For 2016 Q4, there were 28 forecasts for CPI inflation and GDP growth, 27 for Bank Rate and the unemployment rate, 19 for the stock of purchased assets and 10 for the sterling ERI. For 2017 Q4, there were 24 forecasts for CPI inflation and GDP growth, 25 for Bank Rate, 23 for the unemployment rate, 17 for the stock of purchased assets and 10 for the sterling ERI. For 2018 Q4, there were 21 forecasts for CPI inflation, GDP growth and Bank Rate, 20 for the unemployment rate, 14 for the stock of purchased assets and 10 for the sterling ERI.

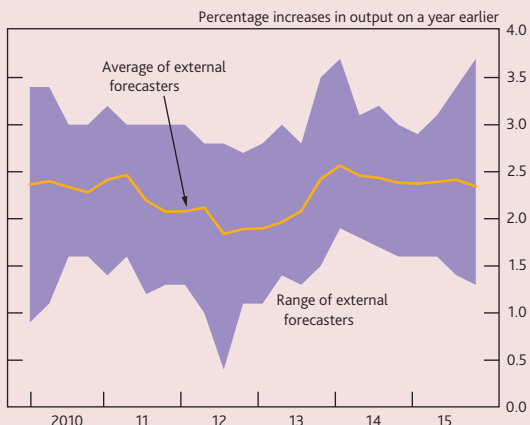
(b) Twelve-month rate.

(c) Four-quarter percentage change.

(d) Original purchase value. Purchased via the creation of central bank reserves.

### Chart A The range of external forecasters' GDP growth expectations has widened

Forecasters' central projections of two year ahead GDP growth

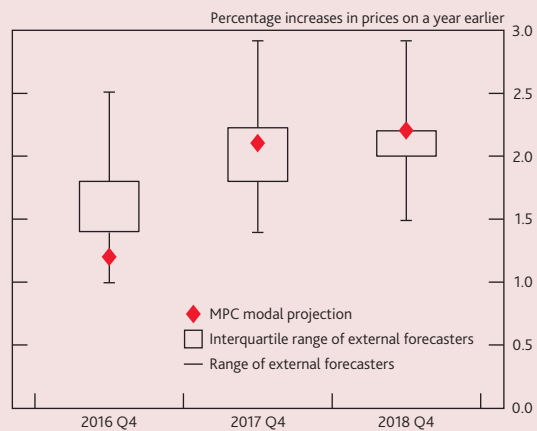


Source: Projections of outside forecasters provided for *Inflation Reports* between February 2010 and November 2015.

The average of respondents' central expectations for CPI inflation in one year's time was 1.6%, higher than the MPC's central projection of 1.2% (Chart B). But at two years and beyond, respondents expected inflation to be around the 2% target, slightly lower than the MPC's projection conditioned on the path for Bank Rate implied by market interest rates. On average, external forecasters thought there

### Chart B Most external forecasters expect inflation to be around the target in two and three years' time

Forecasters' central projections of CPI inflation



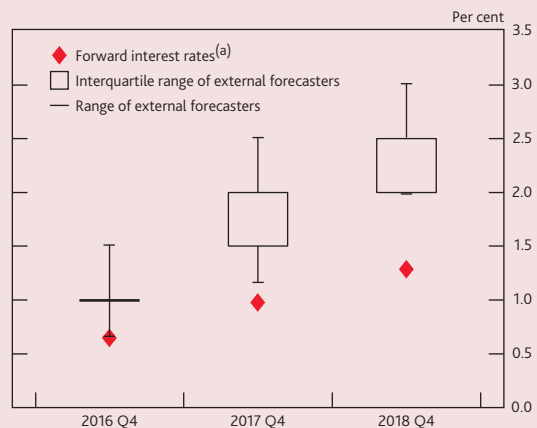
Source: Projections of outside forecasters as of 29 October 2015.

was around a 25% probability that CPI inflation will be above the target in one year's time, while that probability was around 50% in three years' time.

The modal expectation among external forecasters of the first rise in Bank Rate was pushed back to 2016 Q2, compared to 2016 Q1 at the time of the *August Report*. External forecasters continue to expect rises in Bank Rate to be gradual, with an average expectation for Bank Rate of 2.3% in three years' time. The average of forecasters' central expectations for Bank Rate in 2017 Q4 and 2018 Q4 was, however, materially higher than that implied by market interest rates (Chart C).

### Chart C Forecasters expect a broadly higher path for Bank Rate than that implied by market prices

Forecasters' central projections of Bank Rate, and forward interest rates



Source: Projections of outside forecasters as of 29 October 2015, Bloomberg and Bank calculations.

(a) Estimated using instantaneous forward overnight index swap rates in the fifteen working days to 28 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/2015/novofe.pdf](http://www.bankofengland.co.uk/publications/Documents/inflationreport/2015/novofe.pdf).

## How has the economy evolved relative to the August 2014 Report?

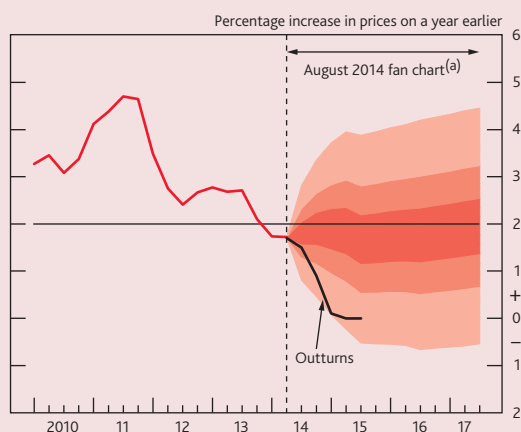
Each year the MPC publishes an assessment of how the economy has evolved relative to its forecasts. This box looks at how outturns for CPI inflation, GDP growth and the unemployment rate compare to projections in the August 2014 *Inflation Report*, and why they have differed from expectations. For a summary of the Independent Evaluation Office's statistical evaluation of the Bank's forecasts made over a longer period, see the box on pages 44–46.

### Key developments

In the August 2014 central projection, output growth was expected to moderate slightly as the boost from pent-up demand faded, and then to grow at rates close to its historical average, sustained by a revival in productivity and household real incomes. The pace at which remaining slack would be absorbed was projected to slow, which, together with the impact of the appreciation in sterling on import prices, would restrain cost pressures. Inflation was expected to remain a little below, but close to, 2%, before reaching the target by the end of the three-year forecast period. The August 2014 forecast was conditioned on broadly stable paths for oil prices and sterling and on a gradual rise in interest rates.

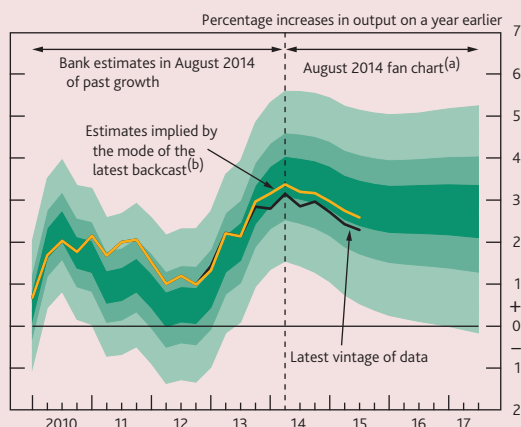
In fact, inflation was 1.7 percentage points weaker than expected in 2015 Q3 (**Chart A**). A significant part — although not all — of that weakness reflects an unexpectedly large fall in oil prices over the past year. Oil prices have fallen by over 50% since August 2014; option prices at the time of the August 2014 *Report* suggested that market participants had placed a negligible weight on such a fall occurring. GDP growth moderated broadly as anticipated, but it was

**Chart A** Inflation has fallen much more than projected  
CPI inflation outturn and projection in the August 2014 *Report*



(a) Based on market interest rate expectations and the assumption that the stock of purchased assets remained at £375 billion throughout the forecast period. See footnote to Chart 5.2 in the August 2014 *Report* for information on how to interpret the fan chart.

**Chart B** GDP growth moderated as anticipated  
GDP outturn and projection in the August 2014 *Report*



(a) Based on market interest rate expectations and the assumption that the stock of purchased assets remained at £375 billion throughout the forecast period. See footnote to Chart 5.1 in the August 2014 *Report* for information on how to interpret the fan chart.

(b) The latest backcast is a judgement about the path for GDP in the mature estimate of the data.

slightly weaker than projected (**Chart B**). Household consumption growth evolved broadly as expected. While exports, stockbuilding and business investment made a weaker-than-expected contribution to GDP growth, that was offset by weaker imports. The unemployment rate evolved broadly in line with the central projection. The rest of this box discusses the underlying drivers of the economy over the past year, relative to the expectations set out in the August 2014 *Report*.

### Global growth has been slower than expected

World GDP rose modestly in the year to 2015 Q2, but at a weaker pace than projected in August 2014 (**Table 1**). That reflected weaker growth in the euro area and in emerging economies. Consistent with the downside news, UK export growth since 2014 Q2 has been weaker than projected.

### Private domestic demand growth has been underpinned by stronger-than-expected productivity and real income growth

While in August 2014, consumption growth was expected to be funded through a pickup in real incomes and a fall in the household saving ratio, in fact, consumption growth rose broadly in line with the rise in real incomes and the saving ratio was flatter than projected (**Table 1**). Real income growth in the year to 2015 Q2 was almost a percentage point higher than anticipated, reflecting the boost from lower energy prices, as well as stronger wage growth.

Business investment growth, however, was weaker than anticipated. That is likely to reflect the impact of oil price falls on capital spending in the extraction sector, as well as weaker external demand. Import growth was also weaker than expected, reflecting weaker growth in import-intensive components of demand.

**Table 1** Assessing the key judgements from the August 2014 Report

Conditioning assumptions and key judgement	Per cent growth between 2014 Q2 and 2015 Q2, unless otherwise stated	
	August 2014 projection	Current estimate
<b>Conditioning assumptions<sup>(a)</sup></b>		
Bank Rate	0.9	0.5
Sterling ERI (index) <sup>(b)</sup>	88.4	91.2
Dollar oil prices	106.7	62.1
<b>1: the global economy expands steadily in the face of continuing economic and financial challenges</b>		
UK-weighted world GDP <sup>(c)</sup>	2¾	2¼
<b>2: a gradual revival in productivity and real incomes underpins a sustained expansion in private sector spending</b>		
Credit spreads <sup>(d)</sup>	-¼	-¼
Household saving ratio <sup>(e)</sup>	-1¼	-½
Business investment <sup>(f)</sup>	11½	3
<b>3: the remaining slack in the economy is absorbed, but at a more gradual pace than in the recent past, reflecting a modest expansion in supply</b>		
Productivity <sup>(g)</sup>	1	1½
Participation rate <sup>(h)</sup>	64	63¼
Average hours <sup>(i)</sup>	32½	32
<b>4: as the drag from slack lessens, the associated path for wage growth and margins is consistent with the inflation target</b>		
Import prices <sup>(j)</sup>	-2½	-1
Unit wage costs <sup>(k)</sup>	½	1½

Sources: Bank of England, BDRC Continental *SME Finance Monitor*, Bloomberg, BofA Merrill Lynch Global Research, British Household Panel Survey, Department for Business, Innovation and Skills, IMF *World Economic Outlook*, ONS and Bank calculations.

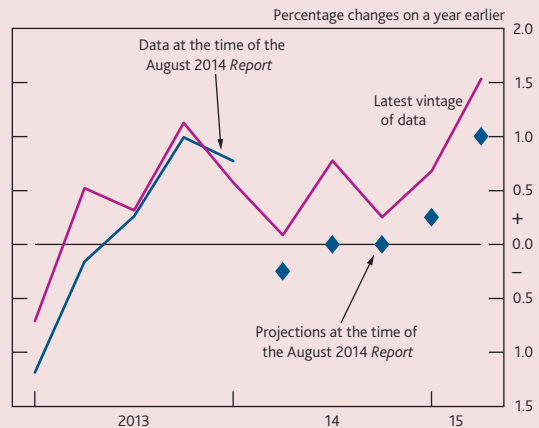
- (a) Average level in 2015 Q2, per cent.  
 (b) Index: January 2005 = 100.  
 (c) See footnote (c) to Table 5.B for information on how world GDP is calculated.  
 (d) Percentage point change between 2014 Q2 and 2015 Q2. See footnote (k) to Table 5.B for a definition of credit spreads.  
 (e) Percentage point change in the household saving ratio.  
 (f) Chained-volume business investment.  
 (g) GDP per hour worked. GDP at market prices is based on the mode of the MPC's backcast.  
 (h) Percentage of 16+ population.  
 (i) Average weekly hours worked in main job and second job.  
 (j) Excludes the impact of missing trader intra-community fraud. As advised by the ONS in the notice released on 2 November 2015 and discussed on pages 25–26, the observation for 2015 Q2 shows the price index for goods excluding oil and erratics, as defined in footnote 1 on page 26, weighted together with the services import price deflator.  
 (k) Employee wages and salaries and household mixed income divided by GDP at market prices based on the mode of the MPC's backcast.

### Supply capacity has expanded, reflecting a pickup in hourly productivity and a diminution in slack

Potential supply growth is judged to have been somewhat stronger than anticipated in 2014. In part, that reflects faster-than-expected hourly productivity growth (Chart C), although some of that rise is likely to reflect cyclical rather than structural factors. Productivity per head, in contrast, rose by slightly less than projected. Correspondingly, the degree of slack over most of the past year is judged to have been somewhat wider than anticipated in August 2014, reflecting greater slack within the labour market. For example, the MPC now judges that the output gap in 2014 Q3 was around ½ a percentage point larger than judged at the time of the August 2014 Report. In 2015 Q2, however, the degree of slack is judged to have been broadly in line with the August 2014 projection.

### The drag on inflation from food and energy prices was greater than expected

Inflation has been significantly weaker than projected in August 2014 (Chart A). Much of that news can be explained

**Chart C** Hourly productivity has risen by more than projected Productivity growth outturn and projection in the August 2014 Report<sup>(a)</sup>

(a) GDP at market prices per hour worked. GDP is based on the mode of the MPC's backcast. Hours worked are based on Bank staff's assumption for population growth, as explained in the May 2015 Report.

by lower-than-expected energy and food prices, reflecting falls in dollar oil and agricultural commodities prices of around 55% and 13% respectively; competition between supermarkets may also have weighed on food price inflation.

Import price inflation was stronger than anticipated in the four quarters to 2015 Q2 (Table 1), despite sterling having been 6% higher relative to the conditioning path for the August 2014 projections and non-energy world export prices falling by more than projected. Reflecting that, past falls in import prices have exerted slightly less of a drag on CPI inflation over the past year than was projected in August 2014.

Despite the greater degree of slack over the past, the pickup in wage growth came through somewhat quicker than projected. Reflecting that pickup, as well as slightly weaker-than-expected growth in productivity per head, unit wage cost growth was stronger than expected in 2015 Q2 (Table 1).

### Implications for the MPC's projections

Overall, growth moderated broadly as anticipated in the August 2014 Report, despite the boost to real incomes from falls in oil prices. In part, that is likely to reflect weaker global growth. Largely due to falls in food, energy and other imported goods prices, inflation was significantly weaker than had been expected in August 2014. These developments are reflected in the key judgements underpinning the MPC's November 2015 forecasts (Section 5). World demand growth is expected to be weaker, weighing on UK GDP growth relative to projections at the time of the August 2014 Report. Some of the recent strength in productivity growth is judged to be cyclical and therefore temporary (Section 3). And the relative resilience of import prices has prompted a reassessment of the extent to which global price pressures will be passed through to UK import price inflation (see the box on pages 28–29).

## The Monetary Policy Committee's response to the Independent Evaluation Office evaluation of the MPC's forecasting performance

The MPC welcomes the Independent Evaluation Office (IEO) evaluation of the MPC's forecasting performance. In late 2014, the IEO was asked by the Court of Directors to provide it with a better basis for evaluating the Bank's forecast performance. The IEO subsequently undertook a wide-ranging statistical evaluation of the Bank's forecasts, the details of which have been published alongside this *Inflation Report*.<sup>(1)</sup> The IEO's assessment reinforces existing initiatives and provides new insights. This box highlights the key empirical findings and recommendations from this work and sets out a series of initiatives that the MPC will be putting in place.

The MPC's macroeconomic projections are central to the formation and communication of its policy decisions. Projections of GDP growth, the unemployment rate and CPI inflation are presented as fan charts, to portray the uncertainty involved; central projections are presented for a number of other variables (Section 5). To improve its understanding of the economy and its forecasting capabilities, the MPC regularly assesses how and why economic developments differed from its earlier central expectations and how the distribution of outturns compares with the fan charts. It has also benefited from a number of independent reports identifying areas for improvement since the MPC's inception in 1997.<sup>(2)</sup>

### Summary of the IEO's work programme

The IEO's work focused on a statistical evaluation of the Bank's forecasts made since 1997 at various horizons. The evaluation covered data outturns up until 2014, so, for example, the most recent two year ahead quarterly forecasts included were made in 2012. The IEO updated previous analysis examining the performance of the MPC's projections for GDP growth and CPI inflation. The IEO's analysis largely reinforced the conclusions of that previous work.<sup>(3)</sup> It expanded on that work by considering the forecasting performance of other key variables of interest to both the MPC and the Financial Policy Committee. It additionally considered how the Bank's projections compared with the forecasts generated by simple statistical processes, and the projections of other central banks and private sector forecasters.

The MPC's projections for GDP growth since 1997 were assessed to have performed relatively well, and did not exhibit statistically significant signs of bias. In other words, projections did not systematically under or overpredict outturns. These projections also compared favourably with

those of private sector institutions. The MPC's inflation projections also showed no statistically significant signs of bias. The forecast accuracy of the MPC's one year ahead inflation projection tended to compare favourably with that of other forecasters. The forecast accuracy of the two year ahead inflation projection compared less favourably, particularly for projections made following the start of the crisis.

The IEO noted a more general deterioration in two year ahead forecast accuracy since the start of the financial crisis, for both GDP growth and inflation. This was not unique to the Bank: projections made by UK private sector forecasters also became less accurate, and it seems likely that the economy became more difficult to forecast following the onset of the crisis. The accuracy of some of the Bank's longer-term forecasts appears to have declined relative to that of other forecasters: an example of this would be the two year ahead inflation projection, where the Bank appears to have underestimated the persistence of factors influencing inflation. The sample in the post-crisis period was relatively small, however, and the IEO stated that these results should be interpreted with caution.

The IEO's work programme also encompassed other variables — such as labour market variables — that have not been evaluated in previously published statistical studies. For much of the period considered, only GDP growth and inflation projections were published, and while projections for other variables provided background information for the forecasts of GDP growth and inflation, the MPC did not formally agree them. Since 2013, the MPC has published a projection for the unemployment rate. Since 2014, it has also included in the *Inflation Report* projections for additional variables produced by Bank staff.<sup>(4)</sup> This follows recommendations made by the Stockton Review.

Over the sample period as a whole, forecasts for the unemployment rate exhibited signs of bias and were less accurate than those produced by a simple statistical rule that assumed outturns for subsequent periods were the same as

(1) The full evaluation can be found at [www.bankofengland.co.uk/about/Documents/ieo/evaluation1115.pdf](http://www.bankofengland.co.uk/about/Documents/ieo/evaluation1115.pdf). More background on the IEO can be found at [www.bankofengland.co.uk/about/Pages/ieo/default.aspx](http://www.bankofengland.co.uk/about/Pages/ieo/default.aspx).

(2) See Pagan, A (2003), 'Report on modelling and forecasting at the Bank of England', *Bank of England Quarterly Bulletin*, Spring, pages 60–88; [www.bankofengland.co.uk/archive/Documents/historicpubs/qb/2003/qb030106.pdf](http://www.bankofengland.co.uk/archive/Documents/historicpubs/qb/2003/qb030106.pdf), and Stockton, D (2012), 'Review of the Monetary Policy Committee's forecasting capability'; [www.bankofengland.co.uk/publications/Documents/news/2012/cr3stockton.pdf](http://www.bankofengland.co.uk/publications/Documents/news/2012/cr3stockton.pdf).

(3) For a recent discussion of the efficiency and bias of the MPC's GDP growth and CPI inflation forecasts see, for example, Hackworth, C, Radia, A and Roberts, N (2013), 'Understanding the MPC's forecast performance since mid-2010', *Bank of England Quarterly Bulletin*, Vol. 53, No. 4, pages 336–50; [www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2013/qb130405.pdf](http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2013/qb130405.pdf).

(4) See for example, **Table 5.B** on page 32 for projections of the variables consistent with the MPC's key judgements, and **5.D** on page 37 for indicative projections of other variables produced by Bank staff to be consistent with the MPC's fan charts.

the latest observation. This in part reflected relatively large forecast errors in the pre-2001 period, perhaps due to a persistent decline, more evident after the event, in the natural rate of unemployment. If the pre-2001 data points were excluded, the findings of bias, and of outperformance by a simple statistical rule, were not statistically significant. That said, the accuracy of the Bank's unemployment forecasts compared relatively poorly with those of other forecasters; the IEO noted signs of improvement more recently, although it is too early to be confident that this represents a systematic change.

The IEO work also considered Bank projections for house price inflation, consumption growth, investment growth, wage growth, lending, US GDP growth and euro-area GDP growth. House price inflation projections had been persistently too low, but since the crisis they had been no less accurate than those of most private sector forecasters. Projections for consumption and investment growth were generally unbiased, although comparisons of forecast accuracy with other institutions' projections showed mixed results. Projections for US and euro-area GDP growth have been broadly as accurate as those produced by the US Federal Reserve and the European Central Bank.

### The MPC's initiatives to strengthen its forecasting capabilities

The IEO made a number of recommendations. The MPC has discussed these and, in the context of initiatives already under way following the 2012 Stockton Review, is taking a number of steps in response.

#### Recommendation 1: Learn more from other models and forecasters

The IEO work suggests that the MPC could benefit from drawing on the insights of other forecasters and other economic models.

**The MPC will expand its suite of statistical models.** The MPC already uses a number of economic models, including some that describe the financial sector and other key economic mechanisms not present in its main forecasting model. This work will expand the suite by increasing the range of models that place a greater emphasis on fitting the data than describing economic channels — so-called 'non-structural' models — as these historically have produced more accurate statistical projections at some forecast horizons.<sup>(1)</sup> Types of model that may be particularly useful to the MPC would be those that require few judgements to be made about certain aspects of the economy, such as its supply potential.

Although such models often have a better forecasting performance they lack a coherent economic structure and are

not suitable for simulating the effects of particular shocks or the impact of changes in policy. So they cannot substitute for the MPC's main structural model, founded in economic theory and estimated on UK data, which is much better suited for answering such questions. Further work is needed on how to use non-structural models as a part of the policymaking process. When agreeing a projection, the MPC would need to weigh up the relative benefits of the two approaches.

**In expanding its use of statistical models, the Bank will engage more with other experts in the field.** This will enable the MPC to benefit from others' modelling expertise when expanding the range of statistical models. One option under consideration is to draw on the work of the external researchers who participate in the Bank's broader research agenda.

This initiative continues a broader aim of increasing external engagement. The Bank has for some years conducted a Monetary Policy Roundtable, twice a year, where outside economists are asked to present views. There is a specialised briefing of the quarterly *Inflation Report* for economists. Following the Stockton Review there has been a greater focus on systematically gathering the views of external commentators on a more regular basis. Moreover, the MPC has three times this year invited groups of academic economists to present their views on topics of interest.

#### Recommendation 2: Learn more systematically from the past

The IEO work programme reiterated the importance of continuing forecast evaluation. Since its inception, the MPC has regularly assessed how and why economic developments differed from its earlier central expectations for GDP growth and inflation and how outturns compare to its fan charts. The MPC's latest evaluation, set out in the box on pages 42–43, evaluates the MPC's August 2014 projections against the key judgements that underpinned them. This allows the MPC to understand the factors explaining such deviations and whether they are likely to persist, providing a firmer basis for making adjustments to its subsequent forecasts. Over time, these evaluations will cover the performance of the wider set of variables published alongside the *Report* since February 2014.

Another recent initiative is the introduction of 'stocktakes' of slower-moving macroeconomic forces, such as the economy's supply potential. These stocktakes consider a wide range of evidence, including from structural and non-structural models, on developments over a number of years. The MPC's

(1) For a recent evaluation of projections from a structural model see Fawcett, N, Körber, L, Masolo, R M and Waldron, M (2015), 'Evaluating UK point and density forecasts from an estimated DSGE model: the role of off-model information over the financial crisis', *Bank of England Staff Working Paper No. 538*; [www.bankofengland.co.uk/research/Documents/workingpapers/2015/swp538.pdf](http://www.bankofengland.co.uk/research/Documents/workingpapers/2015/swp538.pdf).

reassessment of the supply potential of the economy is a recent example of this, and was presented in the May 2015 *Report*.

**Alongside such evaluations, the Bank will undertake a more systematic statistical monitoring of the performance of the MPC's central projections.** These tests, which will be reported to the Bank's Court on a regular basis, will consider any evidence of statistical bias or inefficiency (whether projections could have been improved by incorporating other information). These tests will need to be designed in such a way that the MPC can quickly identify whether outturns differ from expectations by an unusually large degree. Convincingly assessing the statistical performance of a forecast is not possible, however, if there are only a small number of observations, as highlighted in the IEO work.<sup>(1)</sup>

**The Bank will also more systematically assess outturns relative to the MPC's fan charts,** which illustrate the uncertainty around the central projection. If the fan chart accurately describes the uncertainty faced by the MPC, and the sample were sufficiently large, then outturns would be expected to lie evenly across the fan chart distribution.

### **Recommendation 3: Challenge convention more**

The IEO evaluation emphasises the importance of regular opportunities to challenge the MPC's key judgements.

The initiatives addressing Recommendations 1 and 2 will also address this recommendation. And they will complement the changes made following the Stockton Review, which included increased engagement with economic commentators and greater transparency around the variables underlying the MPC's forecasts. These and other initiatives are designed to enhance and encourage challenges to the MPC's view of the outlook.

### **Recommendation 4: Provide more support for non-MPC internal users of the Bank's forecasts**

Projections produced as part of the MPC's forecast process are increasingly used across the Bank in its other policy functions. In order to help these internal users understand the weight they should put on those projections, **clearer guidance will be provided on the level of oversight of different forecast variables.** This will be based on the projections' relative status, and in particular the distinction between the key forecast variables published as fan charts collectively agreed by the MPC, others published in the *Report*, and the less prominent unpublished series.

## **Conclusions**

To help improve its understanding of the economy and so its forecasting capabilities, the MPC regularly assesses its past forecasting performance. In recent years, it has implemented a number of changes designed to improve its forecasting capabilities and make its forecasts more transparent. In light of the IEO work, the MPC has agreed further new initiatives:

- develop a wider range of statistical models;
- further increase engagement with other experts, especially in developing new models;
- develop formal statistical tests to assess the performance of the MPC's projections and to try to identify changes in the economy's behaviour; and
- provide clear guidance to internal users on the relative degree of oversight of the various forecast variables.

Together, the initiatives aim to allow the MPC to identify more quickly whether outturns appear to be systematically moving away from earlier expectations, and to improve the analytical framework underlying its projections. The Bank's forecast processes have also changed in various ways since the 2012 Stockton Review, and it is too soon to assess the impact of those changes. There would therefore be merit in repeating an evaluation exercise of a similar nature in a few years' time.

(1) For a discussion of the issues around testing forecasting performance with a small sample see Broadbent, B (2013), 'Forecast errors'; [www.bankofengland.co.uk/publications/Documents/speeches/2013/speech653.pdf](http://www.bankofengland.co.uk/publications/Documents/speeches/2013/speech653.pdf).

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# Glossary and other information

## Glossary of selected data and instruments

**AWE** – average weekly earnings.

**CDS** – credit default swap.

**CPI** – consumer prices index.

**CPI inflation** – inflation measured by the consumer prices index.

**DGI** – domestically generated inflation.

**ERI** – exchange rate index.

**GDP** – gross domestic product.

**HICP** – harmonised index of consumer prices.

**LFS** – Labour Force Survey.

**PCE** – personal consumption expenditure.

**PMI** – purchasing managers' index.

**RPI** – retail prices index.

**RPI inflation** – inflation measured by the retail prices index.

## Abbreviations

**BCC** – British Chambers of Commerce.

**CBI** – Confederation of British Industry.

**CEIC** – CEIC Data Company Ltd.

**CFO** – chief financial officer.

**ECB** – European Central Bank.

**EU** – European Union.

**FOMC** – Federal Open Market Committee.

**FTSE** – Financial Times Stock Exchange.

**GfK** – Gesellschaft für Konsumforschung, Great Britain Ltd.

**IBES** – Institutional Brokers' Estimate System.

**IMF** – International Monetary Fund.

**MPC** – Monetary Policy Committee.

**MSCI** – Morgan Stanley Capital International Inc.

**MTIC** – missing trader intra-community.

**OECD** – Organisation for Economic Co-operation and Development.

**ONS** – Office for National Statistics.

**OPEC** – Organization of the Petroleum Exporting Countries.

**PNFCs** – private non-financial corporations.

**PPP** – purchasing power parity.

**PwC** – PricewaterhouseCoopers.

**REC** – Recruitment and Employment Confederation.

**S&P** – Standard & Poor's.

**SMEs** – small and medium-sized enterprises.

**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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