

Inflation Report

August 2018



BANK OF ENGLAND



On 16 October 2018, the footnote for Chart D on page 19 was amended to read: 'Wealth decile defined by total gross financial wealth.' The footnote previously read 'Wealth decile defined by total net financial wealth as defined in Chart A.'



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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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Mark Carney, Governor

Ben Broadbent, Deputy Governor responsible for monetary policy

Jon Cunliffe, Deputy Governor responsible for financial stability

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PowerPoint™ versions of the *Inflation Report* charts and Excel spreadsheets of the data underlying most of them are available at

www.bankofengland.co.uk/inflation-report/2018/august-2018

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Monetary Policy Summary

The Bank of England's Monetary Policy Committee (MPC) sets monetary policy to meet the 2% inflation target, and in a way that helps to sustain growth and employment. At its meeting ending on 1 August 2018, the MPC voted unanimously to increase Bank Rate by 0.25 percentage points, to 0.75%. The Committee voted unanimously to maintain the stock of sterling non-financial investment-grade corporate bond purchases, financed by the issuance of central bank reserves, at £10 billion. The Committee also voted unanimously to maintain the stock of UK government bond purchases, financed by the issuance of central bank reserves, at £435 billion.

Since the May *Inflation Report*, the near-term outlook has evolved broadly in line with the MPC's expectations. Recent data appear to confirm that the dip in output in the first quarter was temporary, with momentum recovering in the second quarter. The labour market has continued to tighten and unit labour cost growth has firmed.

The MPC's updated projections for inflation and activity are set out in the August *Inflation Report* and are broadly similar to its projections in May.

In the MPC's central forecast, conditioned on the gently rising path of Bank Rate implied by current market yields, GDP is expected to grow by around 1¾% per year on average over the forecast period. Global demand grows above its estimated potential rate and financial conditions remain accommodative, although both are somewhat less supportive of UK activity over the forecast period. Net trade and business investment continue to support UK activity, while consumption grows in line with the subdued pace of real incomes.

Although modest by historical standards, the projected pace of GDP growth over the forecast is slightly faster than the diminished rate of supply growth, which averages around 1½% per year. The MPC continues to judge that the UK economy currently has a very limited degree of slack. Unemployment is low and is projected to fall a little further. In the MPC's central projection, therefore, a small margin of excess demand emerges by late 2019 and builds thereafter, feeding through into higher growth in domestic costs than has been seen over recent years.

CPI inflation was 2.4% in June, pushed above the 2% target by external cost pressures resulting from the effects of sterling's past depreciation and higher energy prices. The contribution of external pressures is projected to ease over the forecast period while the contribution of domestic cost pressures is expected to rise. Taking these influences together, and conditioned on the gently rising path of Bank Rate implied by current market yields, CPI inflation remains slightly above 2% through most of the forecast period, reaching the target in the third year.

The MPC continues to recognise that the economic outlook could be influenced significantly by the response of households, businesses and financial markets to developments related to the process of EU withdrawal.

The Committee judges that an increase in Bank Rate of 0.25 percentage points is warranted at this meeting.

The Committee also judges that, were the economy to continue to develop broadly in line with its *Inflation Report* projections, an ongoing tightening of monetary policy over the forecast period would be appropriate to return inflation sustainably to the 2% target at a conventional horizon. Any future increases in Bank Rate are likely to be at a gradual pace and to a limited extent.

1 Global economic and financial market developments

The outlook for global activity appears to have moderated slightly and financial conditions have tightened somewhat, particularly in emerging market economies. Growth is expected to remain relatively robust, however. UK financial conditions have tightened slightly, but remain accommodative overall.

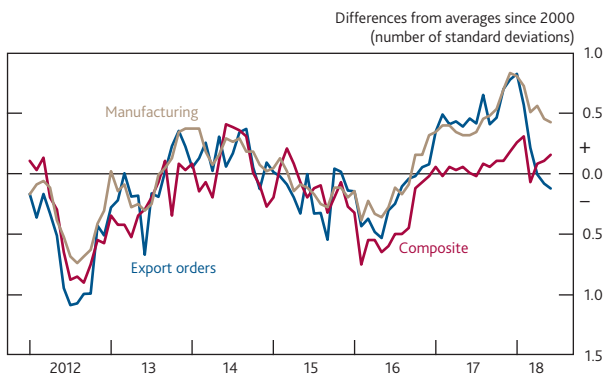
Table 1.A Global GDP growth was broadly stable in Q2
GDP in selected countries and regions^(a)

Percentage changes on a quarter earlier	Quarterly averages						2018	
	1998–2007	2012–13	2014–15	2016	2017 H1	2017 H2	Q1	Q2
	United Kingdom	0.7	0.5	0.7	0.4	0.3	0.4	0.2
Euro area (39%)	0.6	0.0	0.4	0.5	0.7	0.7	0.4	0.3
United States (18%)	0.7	0.5	0.6	0.5	0.6	0.6	0.5	1.0
China (3%) ^(b)	2.5	1.9	1.7	1.7	1.7	1.7	1.4	1.8
Japan (2%)	0.3	0.4	0.1	0.4	0.6	0.4	-0.2	n.a.
India (1%)	1.8	1.6	1.8	1.7	1.5	1.9	1.9	n.a.
Russia (1%) ^(c)	1.9	0.5	-0.3	0.1	0.6	-0.1	0.9	n.a.
Brazil (1%)	0.8	0.6	-0.7	-0.6	0.8	0.2	0.4	n.a.
UK-weighted world GDP ^(d)	0.7	0.4	0.6	0.6	0.7	0.8	0.6	0.7

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

- (a) Real GDP measures. Figures in parentheses are shares in UK goods and services exports in 2016.
- (b) The 1998–2007 average for China is based on OECD estimates. Estimates for 2008 onwards are from the National Bureau of Statistics of China.
- (c) The earliest observation for Russia is 2003 Q2.
- (d) Constructed using data for real GDP growth rates for 180 countries weighted according to their shares in UK exports. Figure for 2018 Q2 is a Bank staff projection.

Chart 1.1 Global export orders growth slowed sharply
Global purchasing managers' indices^(a)



Sources: JPMorgan and Markit Economics.

- (a) Measures of current monthly output, manufacturing output and export orders growth based on the results of surveys in 44 countries. Together these countries account for an estimated 89% of global GDP. Data are to June 2018.

Global GDP growth is estimated to have remained broadly stable in 2018 Q2, a little weaker than expected at the time of the *May Report*, having dipped slightly in Q1 (Table 1.A). Although growth in the US was stronger than expected, activity was somewhat weaker elsewhere.

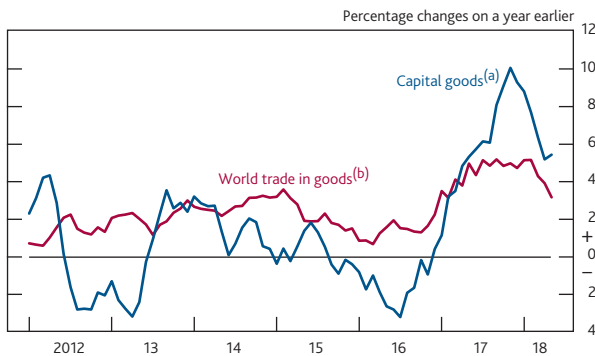
Indicators suggest that the outlook for global growth has moderated slightly, though remains relatively robust. There are signs of slowing in manufacturing and export-focused sectors (Chart 1.1). Consistent with that, growth in global trade and capital goods orders have also declined (Chart 1.2). Most indicators of activity, however, remain above past averages. Global demand growth is expected to remain at a little under ¾% on a UK trade-weighted basis in Q3, continuing to outstrip potential supply growth.

The resulting gradual absorption of spare capacity in many countries should lead to a rise in inflationary pressures. Having been subdued in recent years, wage growth has picked up in both the US and the euro area (Chart 1.3). Higher oil prices over the past year (Chart 1.4) have also pushed up inflation. Although spot oil prices are broadly unchanged in dollar terms since the *May Report*, they are around 55% higher than a year ago. That rise in prices largely reflects subdued oil supply, which has been broadly flat since 2016, despite continued oil demand growth. As a result, in 2018 Q1, oil inventories in the US fell to their lowest level since 2015. The rise in oil prices is projected to push up world export price inflation in the near term.

Diminishing spare capacity and rising inflation will have implications for monetary policy. In the US, the Federal Open Market Committee (FOMC) has continued to tighten policy (Section 1.2). Monetary policy in a number of emerging market economies (EMEs) has also been tightened modestly, as central banks in those countries have responded to the resulting appreciation in the US dollar and reduced demand for EME assets (Section 1.3).

Monetary policy is one factor that has tightened global financial conditions. A summary measure of financial

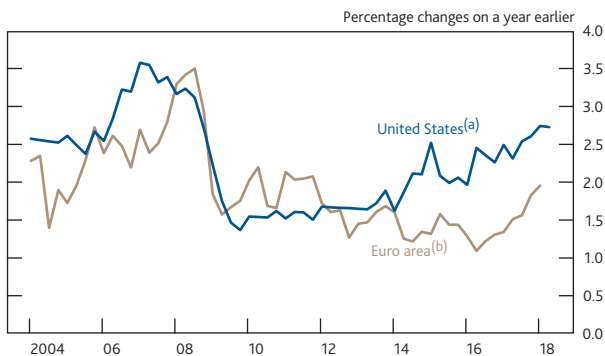
Chart 1.2 Growth in trade and capital goods flows slowed in Q2
World trade in goods and euro-area and US capital goods orders



Sources: CPB Netherlands Bureau for Economic Policy Analysis, European Central Bank, Thomson Reuters Datastream, US Bureau of Labor Statistics, US Census Bureau, World Bank and Bank calculations.

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

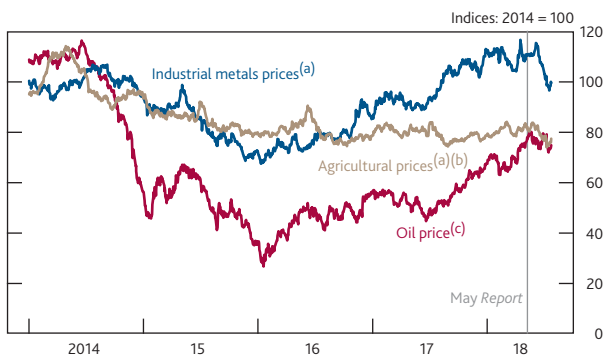
Chart 1.3 Euro-area and US wage growth have picked up
Euro-area and US wages



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

- (a) Employment Cost Index for wages and salaries of civilian workers. Data are to 2018 Q2.
- (b) Compensation per employee. Data are to 2018 Q1.

Chart 1.4 Metals prices have fallen
US dollar oil and commodity prices



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

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

conditions suggests that, having eased substantially during 2016–17 as investor confidence and risk appetite rose, conditions have tightened over 2018 so far (Chart 1.5). Financial conditions remain accommodative, however, relative to past averages. Within that, conditions in emerging markets have tightened by more than elsewhere, and so activity is likely to be dampened in those countries most (Section 1.3). In the UK, the slight tightening in financial conditions will push up the cost of financing for households and businesses modestly (Section 1.4).

In addition to monetary policy, some of the tightening in financial conditions appears to reflect a rise in geopolitical uncertainty, with market contacts reporting a modest deterioration in global risk sentiment among investors. There were sharp falls in Italian asset prices following political developments there, although other euro-area asset prices were less affected. There are also signs of rising trade protectionism globally. Tariffs applied by the US on US\$50 billion of Chinese imports, to go alongside the aluminium and steel tariffs announced earlier in the year, have been met with reciprocal measures. And around US\$200 billion of Chinese goods have been identified by the US as potentially subject to further tariffs.

Uncertainty around tariffs and the resulting impact on trade has led to falls in some equity indices, particularly in emerging markets. Some non-oil commodity prices have also fallen, particularly for metals (Chart 1.4), which market contacts report reflected concern around the effect of higher trade tariffs on demand. However, that uncertainty has not yet been reflected in indicators of consumer and business confidence which, on the whole, have remained relatively robust in the euro area and US (Chart 1.6).

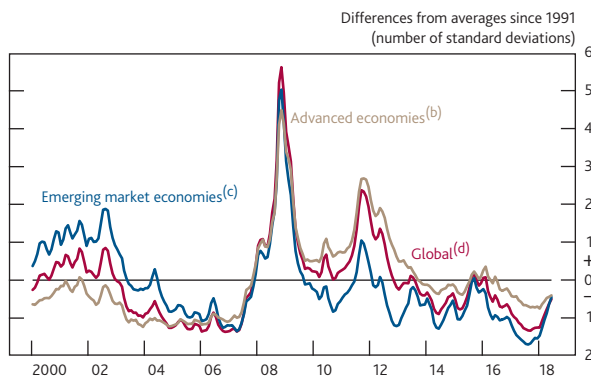
Tighter financial conditions are likely to dampen growth, as are greater barriers to trade. The direct impact of the higher tariffs that have been implemented or proposed on bilateral trade between the US and China and any associated reciprocal measures, as well as wider aluminium and steel tariffs, will weigh somewhat on activity in those countries in coming quarters, and elsewhere to a modest extent. Moreover, the prospect of a further escalation in trade protectionism — particularly if business and consumer confidence and financial conditions were to deteriorate materially — could weigh further on the global outlook.⁽¹⁾

Overall, global growth is expected to remain relatively robust over the next year (Table 1.B), gradually pushing up inflation. That pace of growth, however, is a little slower than projected at the time of the *May Report*, reflecting slightly tighter financial conditions and some direct effects from higher trade tariffs (Section 5).

(1) For more details see Carney, M (2018), 'From protectionism to prosperity'.

Chart 1.5 Global financial conditions have tightened but remain accommodative overall

Financial conditions indices^(a)

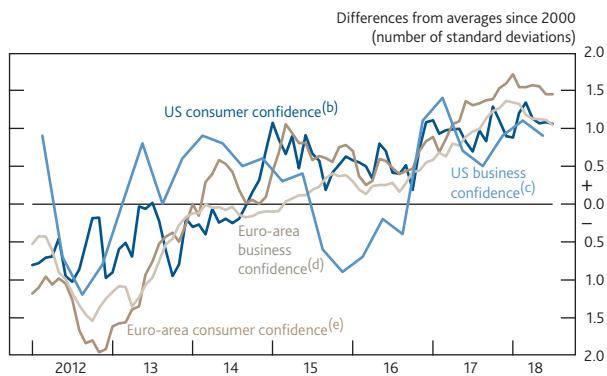


Sources: Bloomberg Finance L.P., Thomson Reuters Datastream and Bank calculations.

- (a) Financial conditions indices (FCIs) are estimated for 43 economies, based on Koop, G and Korobilis, D (2014), 'A new index of financial conditions'. The FCIs summarise information from the following financial series: term spreads, interbank spreads, corporate spreads, sovereign spreads, long-term interest rates, policy rates, equity price returns, equity return volatility, house price returns and credit growth. An increase in the index indicates a tightening in conditions. Data are to end-June.
- (b) Calculated as the average of the following country FCIs: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, South Korea, Spain, Sweden, Switzerland, UK and US.
- (c) Calculated as the average of the following country FCIs: Argentina, Brazil, Bulgaria, Chile, China, Colombia, Hungary, India, Indonesia, Malaysia, Mexico, Peru, Philippines, Poland, Russia, South Africa, Thailand, Turkey and Vietnam.
- (d) Calculated as the average of all country FCIs.

Chart 1.6 Measures of euro-area and US confidence remain robust

Euro-area and US consumer and business confidence^(a)



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

- (a) Monthly data unless otherwise stated.
- (b) University of Michigan consumer sentiment index. Data are not seasonally adjusted.
- (c) The Conference Board measure of CEO Confidence™, ©2018 The Conference Board. Content reproduced with permission. All rights reserved. Data are quarterly and not seasonally adjusted.
- (d) Headline EC sentiment index, reweighted to exclude consumer confidence. Average of overall confidence in the industrial (50%), services (38%), retail trade (6%) and construction (6%) sectors.
- (e) EC consumer confidence indicator.

1.1 The euro area

Quarterly GDP growth in the euro area averaged 0.4% during the first half of the year (Table 1.A). That was lower than anticipated in May and lower than in 2017, when growth averaged 0.7%. That slowdown probably partly reflected temporary factors, including adverse weather in some northern European countries in Q1, particularly Germany and France. And the synchronicity of the slowdown in demand in Q1 globally — reflected in weak export growth — may have pushed up inventories that quarter, so companies may not have had to increase output in Q2 to meet final demand, even as it recovered.

Underlying demand growth in the euro area appears to have remained relatively robust, however. Quarterly consumption growth was 0.5% in Q1, a little stronger than 2017 rates, while both consumer and business confidence remained strong. That should support euro-area activity in coming quarters.

The strength of demand growth over the past two years has steadily reduced the degree of slack in the euro area, but some spare capacity is judged to remain. The unemployment rate, at 8.3% in June (Chart 1.7), is above its estimated equilibrium rate — the rate consistent with stable wage pressures. As set out in the *November 2017 Report*, that equilibrium rate is likely to have fallen in recent years, reflecting the impact of labour market reforms in a number of countries. Consistent with that, although wage growth has picked up since 2016 (Chart 1.3), unit labour cost growth has not increased to the same degree. Core inflation has also remained relatively subdued (Table 1.C). Taken together, that suggests that the economy is still operating some way below full potential.

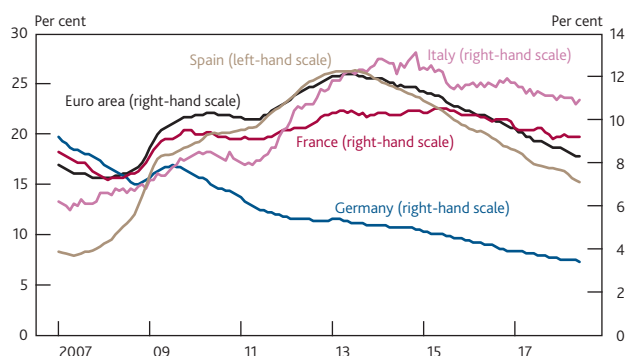
The European Central Bank (ECB) made no changes to its policy rates in June or July, and provided guidance in June that rates were expected to remain at present levels at least through the summer of 2019. The ECB also announced an extension to its asset purchase programme to December 2018, at a slower rate of €15 billion per month, reduced from €30 billion currently, and anticipated an end to net purchases after that date, subject to incoming data.

The announcement in June led to a shift down in the market-implied path for policy rates (Chart 1.8), while longer-term interest rates also fell slightly (Chart 1.9). Despite the lower path for policy rates, financial conditions in the euro area are a little tighter than in May, in part reflecting the slight deterioration in global risk sentiment. Euro-area equity prices are slightly lower (Chart 1.10) while euro-denominated corporate bond spreads have widened (Chart 1.11).

With underlying demand growth still relatively robust, quarterly euro-area activity growth should pick up slightly in

Table 1.B Monitoring the MPC's key judgements

Developments anticipated in May during 2018 Q2–Q4	Developments now anticipated during 2018 Q3–2019 Q1
Advanced economies	Broadly unchanged
<ul style="list-style-type: none"> Quarterly euro-area GDP growth to average a little above ½%. Quarterly US GDP growth to average around ¾%. 	<ul style="list-style-type: none"> Quarterly euro-area GDP growth to average around ½%. Quarterly US GDP growth to average around ¾%.
Rest of the world	Revised down
<ul style="list-style-type: none"> Indicators of activity consistent with four-quarter PPP-weighted emerging market economy growth of around 5%; within that, GDP growth in China to average around 6½%. 	<ul style="list-style-type: none"> Indicators of activity consistent with four-quarter PPP-weighted emerging market economy growth of around 4¾%; within that, GDP growth in China to average around 6½%.
The exchange rate and commodity prices	Oil prices broadly unchanged; sterling lower
<ul style="list-style-type: none"> Commodity prices and the sterling ERI to evolve in line with the conditioning assumptions. 	<ul style="list-style-type: none"> US dollar oil prices are unchanged and the sterling ERI is 2½% lower. Commodity prices and sterling ERI to evolve in line with the conditioning assumptions.
Cost of credit	Broadly unchanged
<ul style="list-style-type: none"> Mortgage spreads to widen a little. 	<ul style="list-style-type: none"> Mortgage spreads to widen a little.

Chart 1.7 Unemployment remains elevated in some euro-area countriesUnemployment rates in selected euro-area economies^(a)

Source: Eurostat.

(a) Percentages of economically active population.

the second half of 2018, to around ½% on average. That outlook is slightly weaker than was projected at the time of the *May Report*, in part reflecting tighter financial conditions, the moderation in global activity and small spillover effects from tariff increases on US-China bilateral trade. These factors are expected to weigh particularly on net trade, which had contributed substantially to euro-area growth in 2017.

1.2 The United States

In contrast to the euro area, activity in the US — the UK's second largest trading partner — rebounded strongly from a dip in growth in Q1, expanding by 1% in Q2. As expected, consumption growth rose in Q2 (**Chart 1.12**), probably reflecting the delayed timing of personal tax refunds shifting spending from Q1 into Q2. The recovery in activity was stronger than expected in May though, driven by a bigger contribution from net trade. That largely reflected erratically strong export growth in certain sectors.

GDP growth is expected to fall back in Q3 as the erratic boost from net trade unwinds, but to remain robust at around ¾% (**Table 1.B**). Activity will be supported thereafter by fiscal policy, following the personal and corporate tax cuts announced in December 2017, as well as the Bipartisan Budget Act of 2018, which lifted discretionary spending caps by around US\$300 billion over 2018 and 2019, equivalent to around 1.5% of GDP. Offsetting that slightly, the higher tariffs that have been implemented or proposed on US trading partners, including China, and associated reciprocal measures, will weigh somewhat on activity growth.

Strong demand growth in recent years has absorbed spare capacity in the US economy, with little, if any, slack remaining. Employment growth has remained solid and the unemployment rate fell in 2018 Q2 to 4.0%, around its lowest level since 2000. Other measures of labour market slack, such as underemployment and the rate at which employees are voluntarily leaving jobs, are around their pre-crisis levels. As the labour market has tightened, annual wage growth has risen (**Chart 1.3**), which is likely to have contributed to a pickup in core inflation (**Table 1.C**).

Reflecting the robust outlook for demand and rising inflation, the FOMC has continued to tighten policy, raising the target range for the federal funds rate to between 1¾% and 2% in June. The median projection of FOMC members for the federal funds rate at end-2018 also rose from 2.1% to 2.4%, implying two further 25 basis point increases in 2018, with a further three projected in 2019. That is a slightly steeper path for policy than implied by market prices (**Chart 1.8**).

As announced in September 2017, the Federal Reserve has continued to reduce its balance sheet by not replacing a proportion of maturing assets. By late July, the balance sheet

Table 1.C Core inflation has picked up in the US, but remains subdued in the euro area

Inflation in selected economies

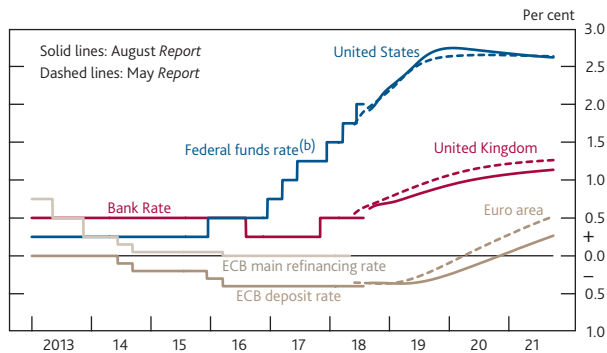
Per cent	Monthly averages					2018			
	1998–2007	2016	2017 H1	2017 H2	2018 Q1	Apr.	May	June	July
Annual headline consumer price inflation									
United Kingdom	1.6	0.7	2.4	2.9	2.7	2.4	2.4	2.4	n.a.
Euro area ^(a)	2.0	0.2	1.6	1.4	1.3	1.3	1.9	2.0	2.1
United States ^(b)	2.1	1.1	1.8	1.7	1.9	2.0	2.2	2.2	n.a.
UK-weighted world inflation ^(c)	2.0	0.8	1.6	1.6	1.6	n.a.	n.a.	2.1	n.a.
Annual core consumer price inflation (excluding food and energy)^(d)									
United Kingdom	1.2	1.3	2.1	2.6	2.5	2.1	2.1	1.9	n.a.
Euro area ^(a)	1.6	0.9	1.0	1.0	1.0	0.8	1.1	0.9	1.1
United States ^(b)	1.8	1.7	1.7	1.5	1.7	1.9	1.9	1.9	n.a.
Annual UK-weighted world export price inflation excluding oil^(c)									
	1.1	-1.8	3.0	1.8	0.7	n.a.	n.a.	1.8	n.a.

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

- (a) Data points for July 2018 are flash estimates.
 (b) Personal consumption expenditure price index inflation. Data points for June 2018 are preliminary estimates.
 (c) UK-weighted world consumer price inflation is constructed using data for consumption deflators for 51 countries, weighted according to their shares in UK imports. UK-weighted world export price inflation excluding oil is constructed using data for non-oil export deflators for 51 countries weighted according to their shares in UK imports. Samples exclude major oil exporters. Data are quarterly. Figures for June are Bank staff projections for 2018 Q2.
 (d) For the euro area and the UK, excludes energy, food, alcoholic beverages and tobacco. For the US, excludes food and energy.

Chart 1.8 The paths for interest rates have flattened slightly in the UK and euro area

International forward interest rates^(a)



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

- (a) The August 2018 and May 2018 curves are estimated using instantaneous forward overnight index swap rates in the 15 working days to 25 July and 2 May respectively.
 (b) Upper bound of the target range.

had shrunk by around US\$170 billion. Reduced reinvestment of past asset purchases, together with the prospect of rises in US government debt issuance following recent tax reforms, could put some upward pressure on longer-term interest rates. Longer-term rates have not yet picked up materially (**Chart 1.9**), however, and remain close to historically low levels. That may reflect the offsetting effect of FOMC communications, which have emphasised that, to the extent that a shrinking balance sheet tightens monetary conditions, the federal funds rate would be commensurately lower.⁽²⁾ Recent capital flows into safe assets in the US as global risk sentiment has deteriorated may also have put downward pressure on longer-term rates. And, as discussed in Box 6, slower-moving structural factors, such as demographics, are likely to continue to weigh on global long-term interest rates for some time.

The FOMC's gradual policy tightening has begun to feed through to US financial conditions. Rates on shorter-term consumer credit have risen steadily, although the cost of mortgages — the majority of which are fixed for 30 years — has picked up by less, consistent with the more limited rise in longer-term rates. Since the *May Report*, US equity prices have risen (**Chart 1.10**), however, while corporate bond spreads have been broadly unchanged (**Chart 1.11**), contrasting with asset price moves elsewhere. Market contacts suggest that higher interest rates and the robust US growth outlook have led to a strengthening of the US dollar which has appreciated by around 5% over the same period on a trade-weighted basis (**Chart 1.13**).

1.3 Emerging market economies

In aggregate, GDP growth in China and other EMEs has remained relatively robust. The outlook for growth, however, is a little weaker than in the *May Report* (**Table 1.B**). The growing prospect of trade protectionism has contributed to falls in equity and corporate bond prices in some countries according to market contacts, which will weigh on activity to some degree. And US monetary policy tightening has also led to a tightening in EME financial conditions.

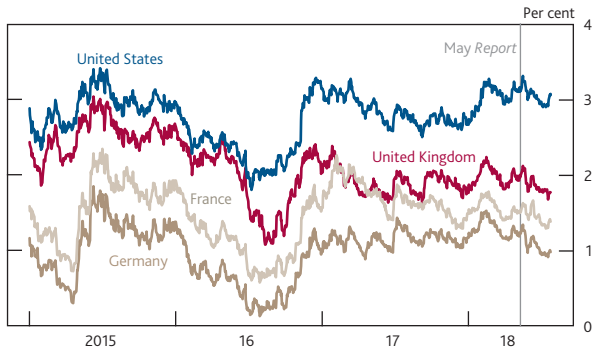
China

Having slowed slightly in Q1, quarterly GDP growth in China increased to 1.8% in Q2 (**Table 1.A**), a stronger pickup than expected in May. The prospect of rising barriers to trade with the US has weighed on asset prices however. The Shanghai Composite equity index is 9% lower than at the time of the *May Report* (**Chart 1.10**) and the renminbi has depreciated (**Chart 1.13**), driven by a 6% fall against the US dollar. The direct impact of tariff changes that have been implemented or proposed so far is judged to weigh on the outlook for activity but that effect is likely to be relatively small.

(2) For more details see Broadbent, B (2018), 'The history and future of QE'.

Chart 1.9 Longer-term interest rates have fallen slightly since May

Five-year, five-year forward nominal interest rates^(a)

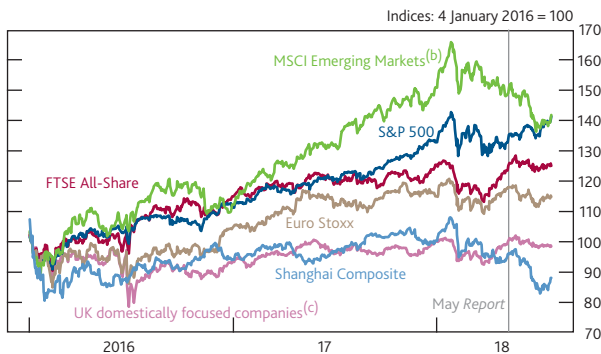


Sources: Bloomberg Finance L.P. and Bank calculations.

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

Chart 1.10 EME equity prices have fallen since the start of the year

International equity prices^(a)

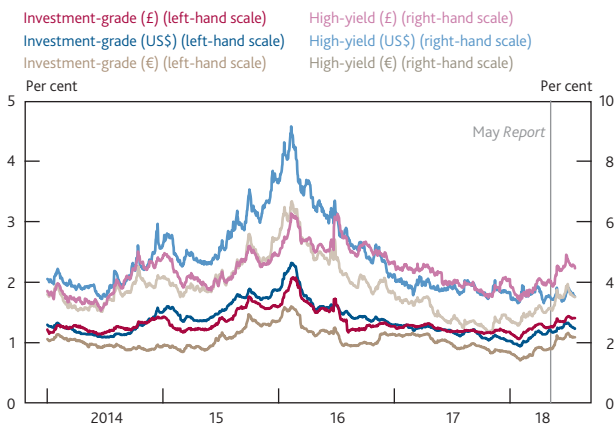


Sources: MSCI, Thomson Reuters Datastream and Bank calculations.

(a) In local currency terms, except for MSCI Emerging Markets which is in US dollar terms.
 (b) The MSCI Inc. disclaimer of liability, which applies to the data provided, is available [here](#).
 (c) UK domestically focused companies are defined as those generating at least 70% of their revenues in the UK, based on annual financial accounts data on companies' geographic revenue breakdown.

Chart 1.11 Corporate bond spreads have widened since May

International non-financial corporate bond spreads^(a)



Sources: ICE/BoAML Global Research, Thomson Reuters Datastream and Bank calculations.

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

Expansionary fiscal policy and continued robust credit growth are expected to support activity in the near term. Survey indicators, such as the Caixin composite PMI, point to continued robust growth. And measures of consumer and business confidence have remained stable in recent months. As discussed in the *June Financial Stability Report*, however, there remain challenges for the Chinese authorities in maintaining current rates of GDP growth while reducing risks to financial stability. A sharp slowdown in China could have a material impact on the UK, both directly and indirectly through trade and financial linkages, and that effect could be amplified by large exchange rate and asset price reactions.⁽³⁾

Non-China emerging market economies

As a whole, activity growth across non-China EMEs was broadly stable in 2018 Q1, but with differences between countries. A slowdown in some countries, such as Brazil and Indonesia, was offset by stronger growth elsewhere. Survey indicators, such as Markit PMIs, have fallen slightly, however, and point to a slowdown in aggregate activity growth in the near term. Non-China EMEs in aggregate account for around 18% of UK trade and, as discussed in the *Financial Stability Report*, disruption in those economies could also have a material impact on the UK via financial conditions and spillovers through other advanced economies.

One factor that is likely to weigh on non-China EME growth over coming quarters is the tightening in US monetary policy. EME financial conditions tend to be sensitive to US financial conditions, in part as some EMEs have high levels of government or corporate debt denominated in dollars. Around 26% of non-China EME non-financial corporate debt is dollar denominated, equivalent to around 12% of nominal GDP, with particularly large concentrations in South America and Turkey. Unless borrowers have revenues in US dollars, or have hedged themselves against exchange rate moves, those debts become costlier to service if the US dollar appreciates, as it has done against nearly all major EME currencies in 2018 so far.

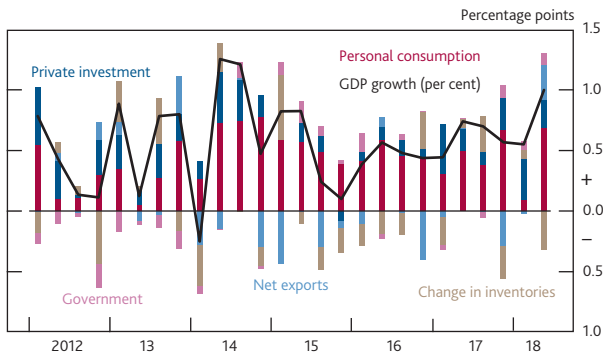
In addition, absent a change in policy rates in EMEs, tighter US policy rates will reduce the relative return on EME assets and, in turn, external demand for those assets. The reduction in demand for EME assets has been exacerbated by rising trade uncertainty, with the integration of many EMEs into global supply chains exposing them to the effects of potential trade disruption. And in the case of some countries, such as Argentina, Brazil and Turkey, institutional and political developments may have further reduced investor demand for their assets.

Perhaps reflecting that, there was a net outflow of portfolio capital from EMEs in Q2 (Chart 1.14). EME equity prices have

(3) For more detail on the linkages between China and the UK economy, see Gilhooly, R, Han, J, Lloyd, S, Reynolds, N and Young, D (2018), 'From the Middle Kingdom to the United Kingdom: spillovers from China', *Bank of England Quarterly Bulletin*, 2018 Q2.

Chart 1.12 US GDP growth picked up sharply in Q2, driven by net exports and consumption

Contributions to quarterly US GDP growth^(a)

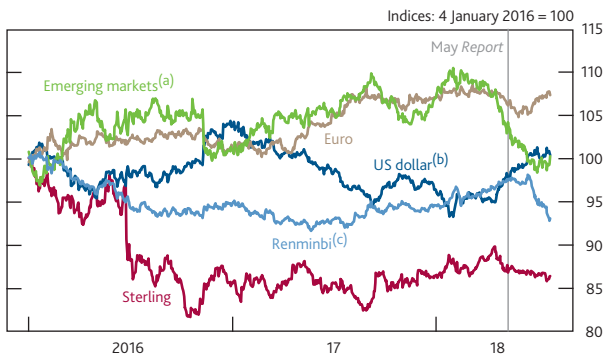


Source: US Bureau of Economic Analysis.

(a) Chained-volume measures.

Chart 1.13 EME currencies have depreciated since May

Effective exchange rates

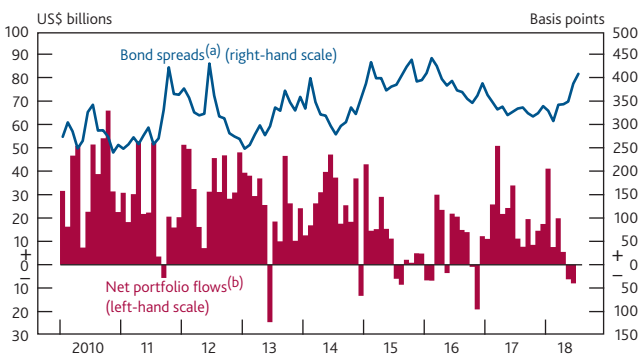


Sources: Bank of England, China Foreign Exchange Trade System (CFETS), ECB, Federal Reserve, JPMorgan and Bank calculations.

(a) JPMorgan Emerging Markets Currency Index.
 (b) Federal Reserve US dollar nominal broad index.
 (c) Trade-weighted index. Calculated as a weighted average of end-day spot bilateral exchange rates, using weights published by the CFETS.

Chart 1.14 Net portfolio capital flows into EMEs were negative in Q2, and bond spreads widened

EME net portfolio capital inflows and government and corporate bond spreads



Sources: Institute of International Finance, JPMorgan, Thomson Reuters Datastream and Bank calculations.

(a) JPMorgan composite emerging market bond index. The JPMorgan disclaimer of liability, which applies to the data provided, is available [here](#).
 (b) Net non-resident portfolio inflows to emerging markets. Data to June 2018.

fallen this year (Chart 1.10), while government and corporate bond spreads have widened. To support exchange rates and capital inflows, a number of EME central banks have increased their policy rates, further tightening financing conditions in those countries. Overall, EME growth is projected to slow over 2018, as tighter financial conditions weigh on activity. That tightening in financial conditions, however, follows a period of substantial easing during 2016–17 (Chart 1.5).

1.4 UK financial conditions

Global developments will affect the UK through their impact on external demand (Section 2), and by influencing UK asset prices and the financial conditions facing UK households and companies. The tightening in global financial conditions has pushed up the cost of finance in the UK modestly, both in capital markets and, by raising the cost of bank funding, through bank lending.

Market interest rates and the exchange rate

At its June meeting, the MPC voted 6–3 to leave Bank Rate unchanged and unanimously to maintain the stock of purchased assets. The majority of the MPC judged that, although news since May had given them greater reassurance that the softness of activity in 2018 Q1 had been largely temporary, there was value in seeing how the data continued to evolve, given signs of a weaker global outlook and tightening in global financial conditions. As discussed in Box 1, the MPC also revised its guidance on the level of Bank Rate at which it would consider starting to reduce the stock of purchased assets, reducing that level to around 1.5%, compared to the previous guidance of around 2%.

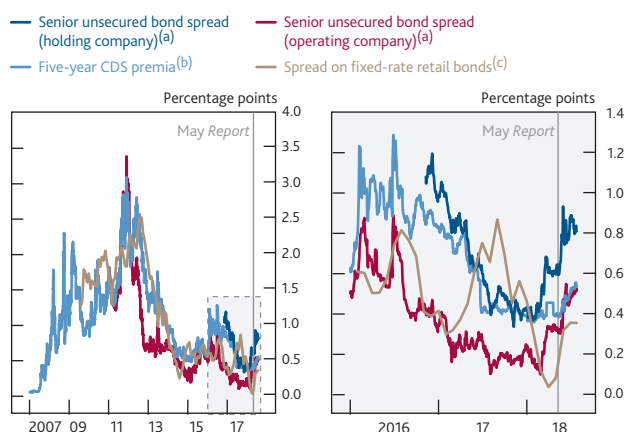
Since the run-up to the *May Report*, UK interest rates have fallen. The market-implied path for Bank Rate in the run-up to the *August Report* reached 1.1% in three years' time, just over 10 basis points lower relative to May (Chart 1.8). Over the same period, the sterling ERI was 2½% lower (Chart 1.13), and 17% below its late-2015 peak. Market contacts suggest that sterling has remained sensitive to shifts in perceptions of the UK's future trading relationships following Brexit and their implications for the economy.

Corporate capital markets

UK equity prices have picked up slightly (Chart 1.10), as the depreciation in sterling since the run-up to the *May Report* increased the value of profits earned by UK-listed companies' overseas operations. The depreciation in sterling has been a significant driver of UK equity prices since the start of 2016, with the FTSE All-Share index around 25% higher over that period. The equity prices of predominantly UK-focused companies are broadly unchanged (Chart 1.10).

Chart 1.15 UK bank funding spreads have widened in recent months

UK banks' indicative funding spreads



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

- (a) Constant-maturity unweighted average of secondary market spreads to mid-swaps for the major UK lenders' five-year euro-denominated bonds or a suitable proxy when unavailable. For more detail on unsecured bonds issued by operating and holding companies, see the [2017 Q3 Credit Conditions Review](#).
- (b) Unweighted average of five-year euro-denominated senior credit default swap (CDS) premia for the major UK lenders.
- (c) Unweighted average of spreads for two-year and three-year sterling quoted fixed-rate retail bonds over equivalent-maturity swaps. Bond rates are end-month rates and swap rates are monthly averages of daily rates. July 2018 bond rates are flash estimates of the provisional estimates, which will be published on 7 August.

Table 1.D Household borrowing rates have remained lowRetail interest rates on lending and deposits^(a)

	Level (per cent)	Changes since (basis points)		
		May 2018	August 2017	May 2016
Households^(b)				
Mortgages:				
Two-year variable rate, 75% LTV	1.56	-3	17	-5
Two-year fixed rate, 60% LTV	1.79	10	55	9
Two-year fixed rate, 75% LTV	1.76	2	33	-15
Five-year fixed rate, 75% LTV	2.04	-2	8	-60
Two-year fixed rate, 90% LTV	2.34	1	1	-41
Consumer credit:				
£10,000 unsecured loan	3.76	3	-3	-57
Deposits:				
Instant access savings	0.21	1	7	-19
One-year fixed-rate bond	0.86	6	0	-5
One-year fixed-rate ISA	1.34	14	23	27
Two-year fixed-rate bond	1.34	20	18	14
Two-year fixed-rate ISA	1.25	1	15	9
PNFCs^(c)				
Outstanding floating loans	2.96	4	38	21
New floating loans	2.48	-3	19	-3

- (a) The Bank's **quoted** and **effective** rate series are weighted averages of rates from a sample of banks and building societies with products meeting the specific criteria. Data are not seasonally adjusted.
- (b) Sterling-only end-month quoted rates. The latest data points are flash estimates of provisional data for July 2018, due to be published on 7 August. Some of the differences in the rates between products will reflect sampling differences.
- (c) Sterling-only average monthly effective rates. The latest data points are for June 2018.

Spreads on corporate bonds — another significant source of finance for large companies — have widened over the past few months ([Chart 1.11](#)). That has raised the cost of finance, although, as discussed in the latest *Financial Stability Report*, spreads remain at levels comparable with those seen before the financial crisis. Since the *May Report*, spreads on sterling investment-grade and high-yield bonds have risen by around 15 basis points and 60 basis points respectively, while spreads on euro-denominated bonds — an important funding market for UK companies — have widened to a similar degree. Alongside shifts in global risk sentiment, market contacts have cited a number of additional drivers of the recent widening in bond spreads including the prospective end of the ECB's corporate bond purchase programme and recent US corporate tax reform, which has encouraged share buybacks among US companies and may have reduced demand for European debt.

Retail interest rates

Global developments can also affect bank borrowing costs for households and corporates, primarily by affecting the cost of wholesale bank funding. Spreads on bank debt funding have picked up materially over 2018 ([Chart 1.15](#)), back to around their average level since 2014. In part, that rise appears to have been driven by the same factors that have pushed up spreads in corporate bond markets more generally. In addition, as discussed in the latest *Financial Stability Report*, stronger bank debt issuance than in recent years, in part as banks look to meet incoming regulatory requirements, has also added to the upward pressure on funding spreads.

The cost of wholesale funding is one factor affecting the rates that banks are willing to pay on retail deposits. Deposit rates have picked up alongside wholesale funding spreads in recent months ([Chart 1.15](#)). Some quoted deposit rates, in particular on shorter-term products, remain lower than they were in 2016 however ([Table 1.D](#)). As discussed in Box 4 of the *February Report*, those shorter-term deposit rates were some way below Bank Rate prior to the crisis and so as Bank Rate subsequently fell to very low levels, deposit rates fell by less. As such, since the rise in Bank Rate in November, the corresponding rise in deposit rates has been somewhat less, as the spread between deposit rates and Bank Rate has begun to return to more normal levels.

Borrowing rates facing households have remained relatively low, though some mortgage rates have picked up slightly in recent months ([Table 1.D](#)). Higher bank funding spreads, alongside the upward-sloping market-implied path for interest rates, are likely to push up household borrowing rates in the near term. The strength of competition in the retail banking market in the face of relatively subdued demand for household credit has pushed down lending rates in recent years, with lenders reducing margins on some products to maintain market share. Lenders noted in recent discussions that,

Box 1**Monetary policy since the May Report**

The MPC's central projection in the *May Report* was for GDP to grow by around 1¾% per year on average over the forecast period. While modest by historical standards, that growth rate was slightly faster than the diminished rate of supply growth, which was projected to average around 1½% per year. As a result, a small margin of excess demand was projected to emerge by early 2020, feeding through into higher rates of pay growth and domestic cost pressures. Nevertheless, CPI inflation was projected to continue to fall back gradually as the effects of sterling's past depreciation faded. Conditional on the path for Bank Rate implied by market interest rates prevailing at the time, inflation was projected to reach the 2% target in two years.

A key assumption in the MPC's May projections was that the dip in output growth in the first quarter of 2018 would prove temporary. At its meeting ending on 20 June 2018, the MPC noted that recent data releases had been broadly consistent with that judgement. A number of indicators of household spending and sentiment had bounced back strongly, employment growth had remained solid and surveys of business activity had been stable. Global activity data had been mixed, however, and downside risks had increased in some emerging markets, although the prospects for global GDP growth remained strong.

CPI inflation had remained unchanged at 2.4% in May. In the near term, inflation was expected to pick up by slightly more than projected in the *May Report*, reflecting higher dollar oil prices and a weaker sterling exchange rate. Most indicators of pay growth had picked up over the past year and the labour market remained tight, suggesting that domestic cost pressures would continue to firm gradually.

The best collective judgement of the MPC remained that, were the economy to develop broadly in line with the *May Report* projections, an ongoing tightening of monetary policy would be appropriate to return inflation sustainably to its target at a conventional horizon. All members agreed that any future increases in Bank Rate were likely to be at a gradual pace and to a limited extent.

Six members judged that an increase in Bank Rate was not required at the June meeting. While the news since the previous meeting had given these members greater reassurance that the softness of activity in the first quarter had been largely temporary, the outlook for global growth had weakened somewhat and global financial conditions had tightened. For these members, there was value in waiting to see how the data evolved.

Three members favoured an immediate increase in Bank Rate of 25 basis points. These members had a higher degree of confidence that the slowdown in Q1 was temporary or erratic, and felt that the most recent labour market indicators indicated some upside risks to the expected pickup in average weekly earnings and unit wage costs.

In addition to its discussion of the immediate policy decision, the MPC reviewed its previous guidance on the level of Bank Rate at which it would consider whether to start to reduce the stock of purchased assets. The MPC continues to expect to maintain the stock of purchased assets until Bank Rate reaches a level from which it can be cut materially. Since its previous guidance, however, the MPC had reduced Bank Rate from 0.5% to 0.25% and had noted that it could be lowered further if required. Reflecting this, the MPC now intends not to reduce the stock of purchased assets until Bank Rate reaches around 1.5%, compared to the previous guidance of around 2%. Consistent with its previous guidance, a decision to start reducing the stock of purchased assets would reflect the economic circumstances at the time.

although further compression as a result of competition was unlikely, margins on lending were not expected to pick up materially.

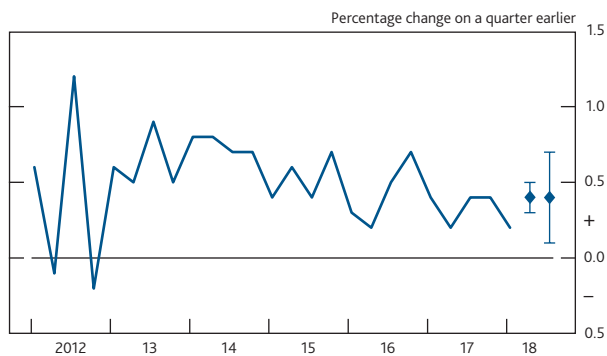
For companies, bank borrowing rates have been broadly stable since May (**Table 1.D**), having picked up gradually since August last year as rises in short-term market interest rates were passed through to lending rates. As most lending to companies is agreed at a floating rate, those rises were passed through fairly quickly to the stock of corporate borrowing.

2 Demand and output

GDP growth is expected to have recovered in 2018 Q2, having slowed temporarily in Q1. Real income growth is recovering following the effects of sterling's depreciation, which should support modest consumption growth. Business investment and net trade should also continue to support GDP growth, though remain sensitive to the global outlook and the effects of Brexit.

Chart 2.1 GDP growth is expected to have picked up in Q2 following temporary weakness in Q1

Output growth and Bank staff's near-term projection^(a)

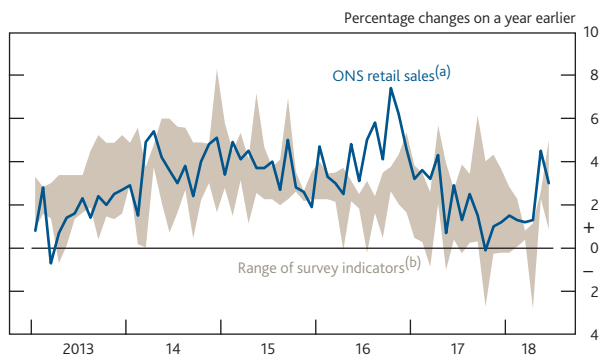


Sources: ONS and Bank calculations.

(a) Chained-volume measure. GDP is at market prices. The diamonds show Bank staff's projection for the first estimate of GDP growth in 2018 Q2 and Q3. The bands on either side of the diamonds show uncertainty around those projections based on the out-of-sample performance of Bank staff's best performing model since 2004, representing ± 1 root mean squared error (RMSE). The RMSE of 0.1 percentage points around the 2018 Q2 projection excludes three quarters affected by known erratic factors: the 2010 snow and the 2012 Olympics and Diamond Jubilee. Including those erratic factors, the RMSE for 2018 Q2 rises to 0.2 percentage points. For 2018 Q3, the RMSE of 0.3 percentage points is based on the full evaluation window.

Chart 2.2 Retail sales growth rose sharply in Q2

Retail sales volumes and survey indicators of retail sales



Sources: Bank of England, British Retail Consortium (BRC), CBI, ONS, Visa and Bank calculations.

(a) Chained-volume measure.

(b) Swathe includes: BRC percentage change in total sales, not seasonally adjusted; balance of respondents to the CBI distributive trade survey question 'How do your sales and orders this month compare with a year earlier?'; percentage change in Visa total consumer spending on a year ago, deflated by CPI inflation; Agents measure of companies' reported annual growth in the value of retail sales over the past three months, monthly measure until August 2016 and six weekly thereafter. All series have been scaled to match the mean and variance of ONS retail sales volumes growth since 2000 except the BRC and CBI series, which are since 1995, and the Visa series, which is since 2006.

2.1 Near-term outlook

Quarterly GDP growth is estimated to have slowed to 0.2% in 2018 Q1 (**Chart 2.1**). That was revised up from 0.1% in the preliminary estimate and, as set out in the *May Report*, it is expected to be revised up further to 0.3% in the mature estimate.

In May, the MPC judged that growth in Q1 was probably depressed by around 0.1 percentage points by disruption from adverse weather. Developments since then have been broadly consistent with that judgement. For example, according to Bank calculations based on responses to the ONS Labour Force Survey, total hours worked were 0.15% lower in Q1 due to the adverse weather.

GDP growth is expected to have recovered to 0.4% in Q2 (**Chart 2.1**), as anticipated in May. That is slightly faster than the estimated growth rate of potential supply — the pace at which output can grow consistent with balanced inflationary pressures. Newly introduced ONS estimates of monthly GDP growth (see Box 2) suggest that growth in the three months to May was 0.2%. That growth rate continued to be depressed by the impact of weak activity in March however, probably due to the adverse weather. By contrast, monthly growth in April and May averaged $\frac{1}{4}\%$.

The recovery in GDP growth in Q2 is expected to have been driven by a pickup in consumption growth, to 0.5% (Section 2.2). A number of indicators of household spending, including consumer credit growth and property transactions (Section 2.3), which were weak in Q1, have bounced back since then, suggesting much of the earlier weakness was erratic. In addition, retail sales grew by 2.1% in Q2 (**Chart 2.2**). Although in the past year the number of retail store closures have increased and retail footfall has fallen, contacts of the Bank's Agents suggest that mainly reflects shifts in consumer demand to online stores and from goods to services. And although growth in household money has slowed, that appears to reflect an unwind of past shifts in demand for different assets (see Box 3).

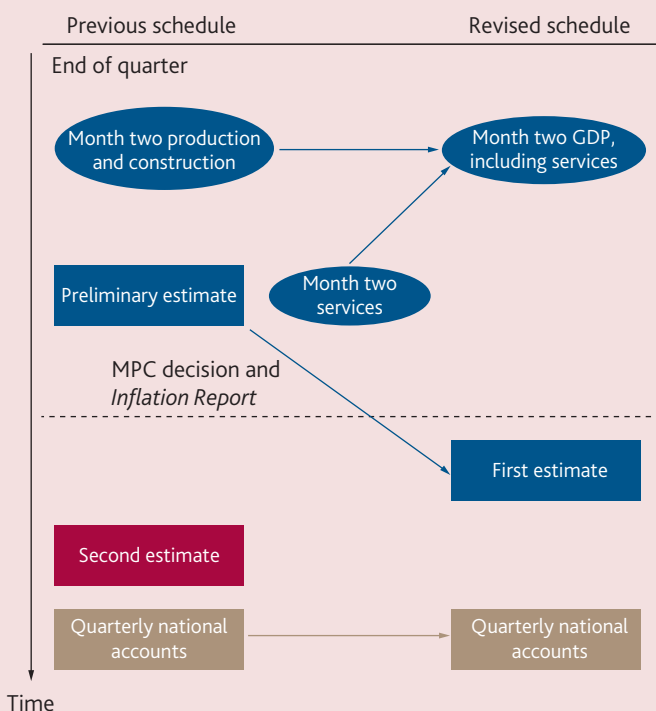
Box 2 Implications of changes to the ONS GDP publication timetable

Following a consultation, the ONS announced improvements to the coverage of GDP estimates and changes to the timing of releases. Those changes are beginning to be introduced, altering the presentation of data for 2018 Q2. This box discusses how the new GDP release schedule affects the MPC’s monitoring of the current economic conjuncture. Overall, the changes have no material implications for the extent of the information available to the MPC at its policy meetings.

The new ONS timetable

To improve the accuracy and reliability of the first estimate of GDP, the ONS is delaying the release by two weeks (**Figure A**), allowing it to incorporate a greater amount of data. While that takes publication beyond the timing of *Inflation Reports*, another welcome development is that monthly estimates of output in the service sector — which constitutes around 80% of the economy — will be published earlier, alongside those for production and construction. That means output data for the first two months of the latest quarter will still be available ahead of each *Report*, and summarised in a new monthly GDP time series. While estimates of the third month will not be available until later, the data content of those in previous preliminary estimates was significantly lower than for the other two months.

Figure A Some releases have been brought forward, with an official estimate of quarterly GDP growth published later



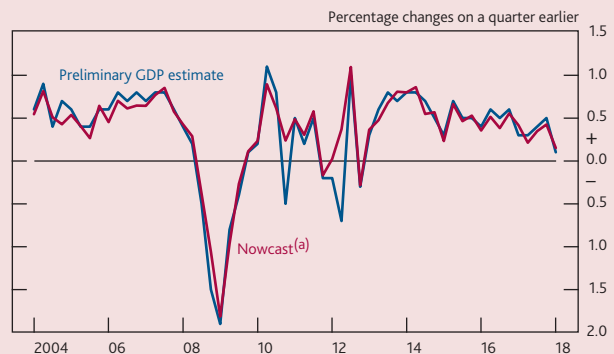
MPC nowcasts

Since official data are published with a lag, the MPC produces estimates of the current rate of GDP growth, or ‘nowcasts’. While such nowcasts are subject to judgement, they are heavily informed by a range of models.⁽¹⁾ One of these models, using a mixed-data sampling (MIDAS) approach, is particularly suited to nowcasting. This model takes into account a range of survey and official data, with the weights attached to the various indicators changing as more data become available. Early estimates place a high weight on the latest surveys, which tend to be more timely, with greater emphasis placed on official data as they become available.

Bank staff nowcasts should provide a good signal for early estimates of quarterly GDP growth. Testing their past performance, by feeding in two months of real-time output data, suggests that GDP nowcasts using Bank staff’s latest MIDAS model would have been within 0.1 percentage points of the ONS’s preliminary estimate on around 80% of occasions since 2004 (**Chart A**).

Chart A Nowcasts based on two months of official data are close to early estimates of quarterly growth

Nowcasts and preliminary estimates of GDP



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

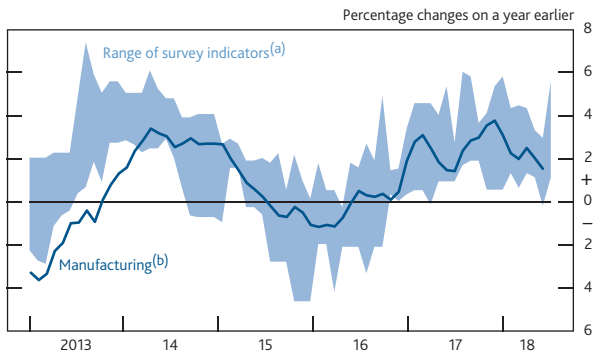
(a) Estimates from Bank staff’s latest MIDAS model, using survey data and real-time ONS data for the first two months of output for the quarter.

Moreover, GDP data are revised over time as a wider range of information becomes available and methodological improvements allow the ONS to measure activity more accurately. Uncertainty around the profile of GDP growth will, therefore, continue to exist beyond the release of early estimates.

(1) For further details, see Anesti, N, Hayes, S, Moreira, A and Tasker, J (2017), ‘Peering into the present: the Bank’s approach to GDP nowcasting’, *Bank of England Quarterly Bulletin*, 2017 Q2. Bank staff have since introduced a new MIDAS model, which is better suited to the ONS’s new publication timetable.

Chart 2.3 Manufacturing output has weakened since the start of 2018

Manufacturing output and survey indicators of manufacturing activity



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

(a) Swathe includes: Markit/CIPS net percentage balance of manufacturing companies reporting that production/output increased this month compared with the previous month; CBI average of the net percentage balances of manufacturing companies expecting the volume of output to rise; EEF average of the net percentage balances of manufacturing companies reporting that total output was expected to increase over the next three months; BCC net balances of manufacturing companies that reported that turnover will improve over the next 12 months; Agents measure of companies' reported annual growth in the value of manufacturing output over the past three months. Scaled to match the mean and variance of four-quarter manufacturing output growth since 2000.

(b) Chained-volume measure at basic prices. Three-month moving average.

Table 2.A Expenditure components of demand^(a)

Percentage changes on a quarter earlier

	Quarterly averages							
	1998–2007	2008–09	2010–12	2013–15	2016	2017 H1	2017 H2	2018 Q1
Household consumption ^(b)	0.8	-0.5	0.1	0.6	0.8	0.5	0.2	0.2
Private sector investment	0.7	-4.5	2.0	1.1	0.5	1.2	1.1	0.1
<i>of which, business investment^(c)</i>	0.7	-3.4	2.2	0.6	-0.1	0.7	0.4	-0.4
<i>of which, private sector housing investment</i>	0.6	-7.0	1.4	2.6	1.8	2.1	2.7	1.1
Private sector final domestic demand	0.8	-1.1	0.5	0.8	0.4	0.9	0.4	0.2
Government consumption and investment ^(c)	0.9	0.8	-0.2	0.3	0.2	0.3	-0.1	-0.8
Final domestic demand	0.8	-0.6	0.3	0.7	0.3	0.7	0.3	0.0
Change in inventories ^{(d)(e)}	0.0	0.0	0.1	0.0	0.2	-0.5	-0.3	1.0
Alignment adjustment ^(e)	0.0	-0.1	0.0	0.0	0.0	0.0	0.2	-0.7
Domestic demand ^(f)	0.8	-0.7	0.4	0.8	0.5	0.4	0.2	0.2
'Economic' exports ^(g)	1.1	-1.3	1.0	0.9	0.9	0.7	0.9	0.1
'Economic' imports ^(g)	1.4	-1.1	0.8	1.2	0.9	0.6	0.2	-0.1
Net trade ^{(e)(g)}	-0.1	0.0	0.1	-0.1	0.0	0.0	0.2	0.1
Real GDP at market prices	0.7	-0.7	0.4	0.6	0.4	0.3	0.4	0.2
Memo: nominal GDP at market prices	1.2	-0.2	0.9	0.9	1.2	0.7	0.7	0.8

(a) Chained-volume measures unless otherwise stated.

(b) Includes non-profit institutions serving households (NPISH).

(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.

In contrast to consumption, net trade is expected to have subtracted from growth in Q2, in part due to a fall in goods exports (Section 2.4). Consistent with that, manufacturing output has weakened since the start of 2018 (Chart 2.3), although part of that recent fall could reflect a lagged impact from the weather-related disruption in Q1. Companies built up inventories in the first quarter (Table 2.A), but surveys suggest that inventories fell back in Q2 and so companies should need to raise activity to meet further demand growth. Net trade is projected to contribute positively to growth in subsequent quarters.

GDP growth is projected to remain at 0.4% in Q3 (Chart 2.1). Most survey indicators of output remain consistent with steady growth over the rest of 2018.

2.2 Consumer spending

Consumer spending is determined largely by household incomes. Household real income growth has been weak since 2016 (Chart 2.4) due to rises in import prices following the depreciation of sterling associated with the EU referendum and subdued nominal pay growth over that period. As the effects of the fall in sterling on inflation fade and nominal pay growth continues to pick up, real income growth is expected to be higher than in recent years, supporting consumption growth (Section 5).

Over the recent past, consumption growth has slowed by less than real income growth and, as a result, the saving ratio has fallen since the end of 2015 (Chart 2.4). The extent to which households choose to save or borrow is likely to depend in part on the state of their balance sheets, which are relatively strong compared to the past (see Box 4).

Another factor that can affect how much households spend or save is their confidence in future income growth. The headline GfK measure of consumer confidence has been broadly stable since mid-2016 (Chart 2.5). Within that, the balance for households' expectations of their personal situation, which tends to be well correlated with spending growth, has risen in recent months. Consumer confidence is likely to have been supported by the strength of the labour market (Section 3) with the latest IHS Markit Household Finance Index suggesting that job security was around its highest level since the series began in 2009.

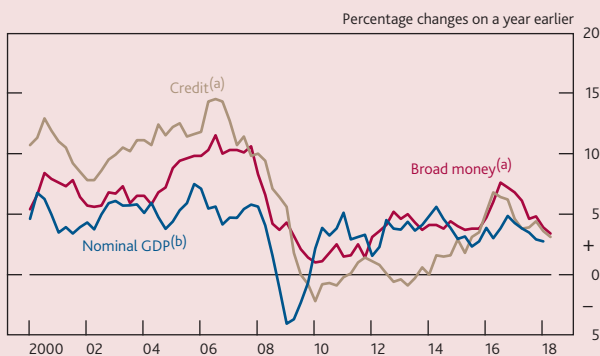
Household spending will also be influenced by interest rates. First, changes in how much income households receive from their deposits or are required to pay on their debts will affect how much they have available to spend. Net savers are typically less inclined to spend out of a rise in income than net borrowers and so rises in interest rates tend to depress spending overall. Second, interest rates can influence how much of their incomes households choose to save, or how

Box 3 Developments in broad money

Money is the key medium of exchange with which to make payments for goods and services.⁽¹⁾ As such, money growth may provide a signal for recent and future trends in activity and inflation.⁽²⁾ There are a number of factors that affect the amount of money in circulation, however, and understanding why money growth has evolved as it has is important in assessing what signals to take from it. This box considers recent developments in broad money — the amount of money held in bank deposits and as cash in circulation.

Twelve-month growth in broad money slowed to 3½% in 2018 Q2, having been above 7% in 2016 H2 (Chart A). That has brought the rate closer to nominal spending growth, which has also slowed, albeit to a lesser degree. A slowdown in credit growth since 2016 is likely to have been a contributing factor to the slowing in money growth as it is the main source of money creation.⁽³⁾ Indeed, the two have slowed by a similar extent.

Chart A Broad money growth has slowed since 2016, as have credit and spending growth
Broad money, nominal GDP and credit



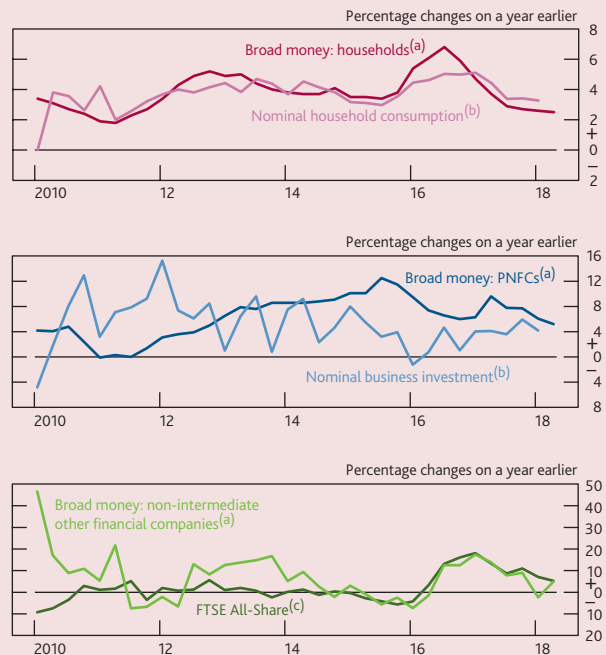
(a) M4 and M4 lending excluding the deposits of, and borrowing by, intermediate other financial corporations.
(b) At current market prices. Data are to 2018 Q1.

Looking beneath the aggregate data, developments in money holdings across different sectors of the economy may also help to highlight trends. Those developments can, however, also reflect other factors that have limited implications for spending prospects, which appears to have been the case recently. And since the sectors are interconnected, developments in one sector can also spill over to others as money circulates around the economy.

The slowing in aggregate broad money growth since 2016 largely reflects slower growth in households' deposits and cash holdings (Chart B). Household spending growth has slowed at the same time, albeit by slightly less. Although household spending and money growth are correlated, other household indicators (Section 2.2) have statistically been better

Chart B Household money growth has fallen below spending growth, while corporate money growth continues to exceed investment growth

Sectoral broad money, spending and equity prices



(a) Monetary financial institutions' sterling M4 liabilities to the respective sectors.
(b) At current market prices. Data are quarterly to 2018 Q1.
(c) End-quarter observations.

predictors of spending, and money balances have provided little incremental information over and above those.

As discussed in past *Reports*, the pickup in household money growth during 2016 occurred alongside a reduction in households' investment fund holdings and so appeared to reflect a desire among households to hold more liquid assets in the face of heightened uncertainty around the referendum. The subsequent slowing in household money growth appears in part to reflect some of that precautionary demand subsiding, as investment fund holdings have risen. To the extent that it reflects a shift in demand for different assets, its effect on money growth is likely to be temporary and to be less informative about spending prospects.

Private non-financial companies' (PNFCs') deposits have in the past appeared to be a leading indicator of business investment growth.⁽⁴⁾ Growth in PNFCs' money holdings has been robust

(1) For further discussion of the role of money in the economy see Carney, M (2018), 'The future of money'.
(2) See for example McLeay, M and Thomas, R (2016), 'Broad money growth in the long expansion, 1992–2007: what can it tell us about the role of money?', in Chadha, J, Chrystal, A, Pearlman, J, Smith, P and Wright, S (eds), *The UK economy in the long expansion and its aftermath*, Cambridge University Press.
(3) For further detail on how money is created see McLeay, M, Radia, A and Thomas, R, (2014), 'Money creation in the modern economy', *Bank of England Quarterly Bulletin*, 2014 Q1.
(4) See for example Brigden, A and Mizen, P (2004), 'Money, credit and investment in the UK industrial and commercial companies sector', *The Manchester School*, Vol. 72, No. 1, pages 72–79.

in recent years, having picked up since 2011 (Chart B). But that in part appears to have reflected an increase in companies' desired money holdings — continuing a trend that emerged prior to the crisis — perhaps for precautionary purposes. As such, nominal business investment growth continues to be modest despite that growth in companies' money holdings. Nevertheless, those higher balances may provide some support to future business investment growth.

Money holdings of non-intermediate financial companies — covering pension funds and other asset managers — may influence, as well as be influenced by, asset prices.⁽⁵⁾ Many of the MPC's asset purchases, announced in August 2016, will have been bought from asset managers and hence boosted their money holdings at the time. To the extent that their money holdings were above desired levels as a result, they may have bought other assets to rebalance their portfolios, boosting the prices of those assets.⁽⁶⁾ For example, growth in equity prices appear to have been correlated with growth in

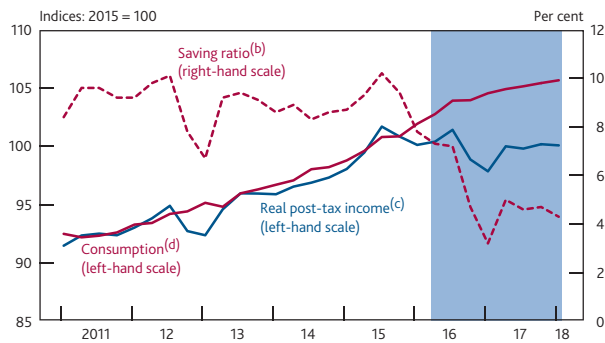
money holdings (Chart B). The impact on equity prices of those and earlier asset purchases by the Bank are difficult to detect, however, given the many other factors that affect them.⁽⁷⁾ For example, the decline in the exchange rate during 2016 boosted the sterling value of profits earned in UK-listed companies' overseas operations, and therefore sterling equity prices (Section 1).

Overall, money growth can be affected by a number of factors that complicate its relationship with activity and prices. Underlying trends in money holdings do tend to broadly coincide with nominal spending, however, and as a timely indicator of economic developments, the MPC will continue to monitor them closely alongside other indicators of spending.

(5) See for example Congdon, T (2005), 'Money and asset prices in boom and bust', *Institute of Economic Affairs, Hobart Paper No. 152*.
 (6) For further detail on the link between asset purchases and the broad money stock, see Butt, N, Domit, S, McLeay, M and Thomas, R (2012), 'What can the money data tell us about the impact of QE?', *Bank of England Quarterly Bulletin*, 2012 Q4.
 (7) For further discussion see Broadbent, B (2018), 'The history and future of QE'.

Chart 2.4 Consumption growth has slowed by less than real income growth so the saving ratio has fallen

Consumption, real post-tax income and household saving^(a)

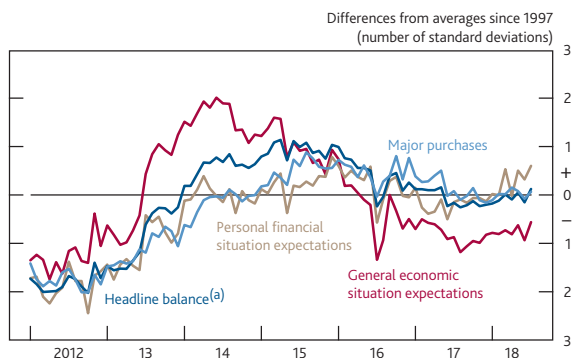


Sources: ONS and Bank calculations.

(a) Shaded area denotes the period following the EU referendum. All series include NPI5H.
 (b) Saving as a percentage of household post-tax income.
 (c) Nominal post-tax income divided by the consumption deflator.
 (d) Chained-volume measure.

Chart 2.5 Consumer confidence has been broadly stable since mid-2016

Indicators of consumer confidence



Sources: GfK (research carried out on behalf of the European Commission) and Bank calculations.

(a) Average of the net balances of respondents reporting that: their financial situation has got better over the past 12 months; their financial situation is expected to get better over the next 12 months; the general economic situation has got better over the past 12 months; the general economic situation is expected to get better over the next 12 months; and now is the right time to make major purchases, such as furniture or electrical goods.

much they borrow to supplement their income, with higher interest rates increasing the attractiveness of saving and reducing that of spending, all else equal.

In the mortgage market, lower bank funding costs and intensifying competition have led to a reduction in mortgage rates in recent years. Some households will have benefited from those low rates either by taking out new mortgages or by remortgaging, which all else equal will have boosted household spending. Bank funding costs have risen more recently (Section 1), however, and are starting to be passed through to higher mortgage rates.

In consumer credit, there is evidence of a modest tightening in conditions over the past year. The maximum interest-free period on credit card balance transfers and on purchases, on average across lenders, have both continued to fall, while the average quoted rate on credit cards has risen. Consumer credit conditions remain supportive, however, and results from the latest Bank/NMG survey show that the share of respondents concerned about their access to credit remains low.

Taking these influences together, consumption is expected to grow modestly in coming quarters, at around ¼% on average (Table 2.B), broadly in line with real incomes and supported by accommodative financial conditions. That outlook is corroborated by results of a survey of companies on consumer demand conducted by the Bank's Agents in May, where respondents expected stronger consumer income growth and confidence to drive an acceleration in sales volumes over the next 12 months.

Table 2.B Monitoring the MPC’s key judgements

Developments anticipated in May during 2018 Q2–Q4	Developments now anticipated during 2018 Q3–2019 Q1
Consumer spending	Broadly unchanged
<ul style="list-style-type: none"> Quarterly real post-tax household income growth to average ¼%. Quarterly consumption growth to average ¼%. 	<ul style="list-style-type: none"> Quarterly real post-tax household income growth to average ¼%. Quarterly consumption growth to average ¼%.
Housing market	Revised up slightly
<ul style="list-style-type: none"> Mortgage approvals for house purchase to average around 65,000 per month. The average of the Halifax/Markit and Nationwide house price indices to increase by around ¾% per quarter, on average. After recovering somewhat in 2018 Q2, housing investment to be broadly flat. 	<ul style="list-style-type: none"> Mortgage approvals for house purchase to average around 65,000 per month. The average of the Halifax/Markit and Nationwide house price indices to increase by around ¾% per quarter, on average. Housing investment to average ½%.
Business investment	Broadly unchanged
<ul style="list-style-type: none"> Quarterly growth in business investment to average ¾%. 	<ul style="list-style-type: none"> Quarterly growth in business investment to average ¾%.
Trade	Broadly unchanged
<ul style="list-style-type: none"> Net trade to provide a significant boost to quarterly UK GDP growth. 	<ul style="list-style-type: none"> Net trade to provide a positive contribution to quarterly UK GDP growth.

Chart 2.6 Mortgage approvals for house purchase have been stable but subdued
Mortgage approvals

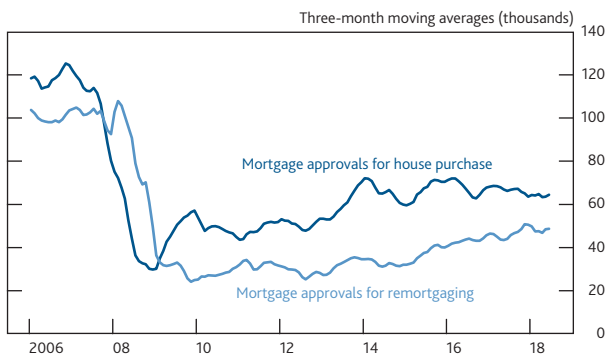
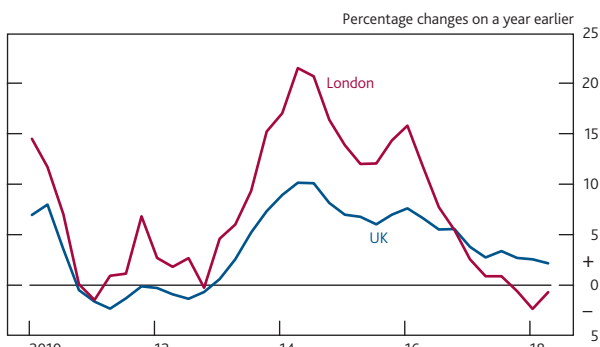


Chart 2.7 House price inflation has slowed particularly sharply in London
House prices^(a)



Sources: IHS Markit, Nationwide and Bank calculations.

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

2.3 Housing

Developments in the housing market can provide a signal about household spending more generally. Over the past few years, activity in the housing market has been broadly stable, but subdued. Mortgage approvals have been broadly unchanged since mid-2016 despite low interest rates (Chart 2.6). Annual house price inflation has slowed since the start of 2016, by around 5 percentage points, to 2.2% in 2018 Q2 according to the average of lenders’ indices (Chart 2.7), slower than expected at the time of the *May Report*. Consistent with that, official UK data to May suggest house price inflation has declined to a similar degree. Rent inflation has also slowed and was around 1% in the year to 2018 Q2 (Chart 2.8).

That weakness in the housing market appears to be concentrated in London. In 2018 Q1, mortgage completions for housemovers and first-time buyers in London were around 12% lower than in 2016, and house price (Chart 2.7) and rent inflation (Chart 2.8) have both fallen sharply and are now negative.

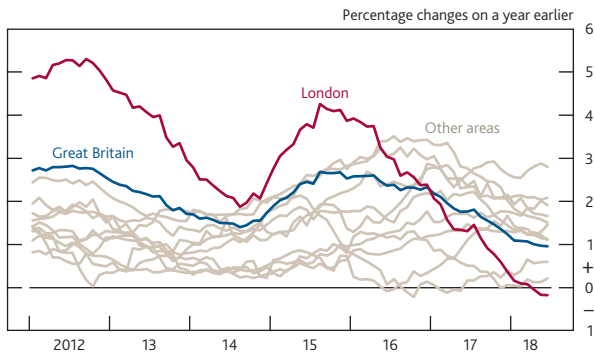
Although developments in London have tended to lead other areas in the past, if the reasons for the current weakness in London are fairly idiosyncratic, they may indicate little about prospects for the UK housing market as a whole. London house price inflation was particularly strong from 2014–16 (Chart 2.7), reducing affordability. Given its relatively high level of house prices, London was likely to have been disproportionately affected by regulatory and tax changes since 2014. The recent slowing in house prices has brought London more into line with other areas. The slowing in the buy-to-let market, as mentioned in previous *Reports*, may have affected London more than other areas, as London accounts for a substantial proportion of UK buy-to-let activity.

Some of the weakness in the London market may also reflect a fall in net EU migration (Section 3), alongside wider Brexit uncertainty. The number of EU nationals in London appears to have fallen slightly since the EU referendum, although it has continued to grow in other regions. As EU nationals make up around 12% of households in London and 20% of the private rental sector, that fall will affect demand for housing services and therefore house prices and rents. Alongside that, more respondents to the RICS housing survey in London than in other areas reported increased uncertainty about the UK’s future relationship with the EU and an associated negative impact on house prices.

In the near term, modest real income growth and accommodative credit conditions should support housing market activity. Mortgage approvals are projected to remain stable and UK house price inflation is expected to pick back up to a little over 3% by mid-2019 (Table 2.B).

Chart 2.8 Slowing rent inflation has been largely concentrated in London

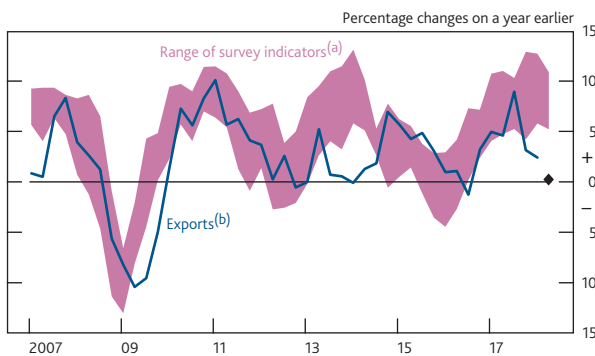
Private housing rent^(a)



(a) Not seasonally adjusted. Data for Northern Ireland are not available.

Chart 2.9 UK export growth appears to have slowed in Q2 although survey indicators remain robust

UK exports and survey indicators of export growth

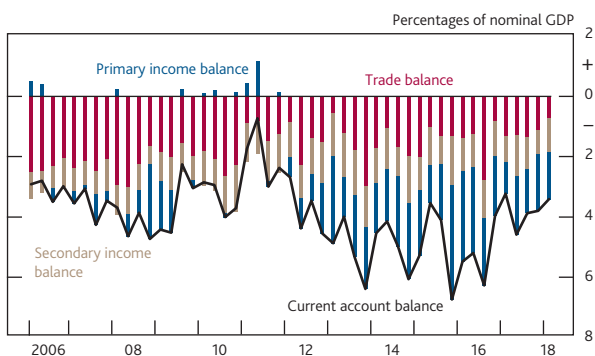


Sources: Bank of England, BCC, CBI, EEF, IHS Markit, ONS and Bank calculations.

- (a) Swatthes includes: BCC net percentage balance of companies reporting that export orders and deliveries increased on the quarter (data are not seasonally adjusted); CBI average of the net percentage balances of manufacturing companies reporting that export orders and deliveries increased on the quarter, and that their present export order books are above normal volumes (the latter series is a quarterly average of monthly data); Markit/CIPS net percentage balance of manufacturing companies reporting that export orders increased this month compared with the previous month (quarterly average of monthly data); Agents measure of manufacturing companies' reported annual growth in production for sales to overseas customers over the past three months (last available observation for each quarter); EEF average of the net percentage balances of manufacturing companies reporting that export orders increased over the past three months and were expected to increase over the next three months. Indicators are scaled to match the mean and variance of four-quarter export growth since 2000.
- (b) Chained-volume measure, excluding the impact of MTIC fraud. The diamond shows Bank staff's projection for 2018 Q2.

Chart 2.10 The current account deficit narrowed in Q1

UK current account



Developments in the housing market will also contribute to GDP directly through housing investment. Housing investment fell by 0.5% in 2018 Q1, but that may in part reflect adverse weather, which hampered construction activity. Construction activity is expected to have recovered in Q2, although contacts of the Bank's Agents report that capacity constraints were limiting the extent to which any output lost in Q1 could be subsequently made up. New housing orders, which are an indicator of private housing starts and therefore investment, rose by 19% in 2018 Q1 to their highest level since the crisis. This will support housing investment over the rest of the year.

2.4 Net trade and the current account

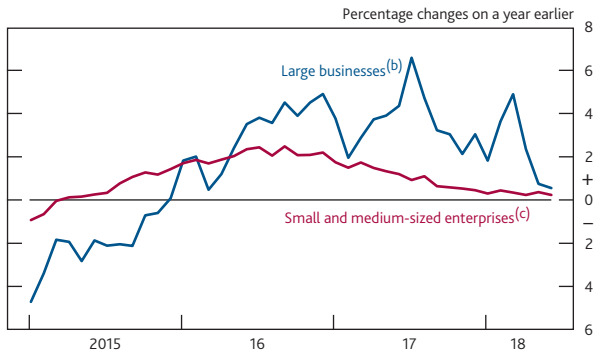
Net trade contributed positively to GDP growth in 2017 and continued to do so in 2018 Q1 (Table 2.A). In contrast, net trade is expected to have subtracted 0.6 percentage points from GDP growth in Q2. However, the recent fall in part reflects volatility in net exports of non-monetary gold, which do not affect aggregate GDP as they are offset by changes in the contribution to private sector investment in valuables. Survey indicators of export growth remain robust (Chart 2.9) and demand for exports will continue to benefit from relatively robust global growth (Section 1). The outlook for net trade will depend on how the supply chains and capacity of companies, both here and abroad, evolve in response to Brexit and associated movements in sterling. But net trade is expected to continue to make a positive contribution to GDP growth in coming quarters.

The current account deficit — which reflects the balance of nominal trade flows and other payments between the UK and the rest of the world — narrowed to 3.4% of GDP in 2018 Q1 (Chart 2.10). That reflected a narrowing in the deficits on both the trade balance and the primary income balance — the net value of investment income received by UK residents. Over 2008–17, the trade deficit is estimated to be around 0.4% of GDP narrower on average than previously estimated. That reflects revisions to data in *Pink Book 2018* following a methodological change that increased the estimated level of services exports.

2.5 Business investment

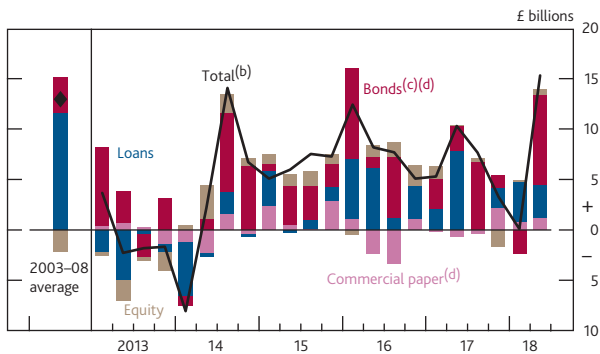
Business investment fell by 0.4% in 2018 Q1 (Table 2.A). That fall was driven by investment in construction-related assets, which may have reflected the effect of adverse weather. Even looking through that volatility, however, business investment growth has continued to be weaker in recent years than in previous recoveries and lower than would be expected given accommodative financial conditions and relatively robust global growth.

Chart 2.11 Growth in bank lending to companies has slowed
Lending to UK non-financial businesses^(a)



(a) Rate of growth in the stock of lending by UK monetary financial institutions (MFIs) in all currencies, expressed in sterling. Not seasonally adjusted.
 (b) Large businesses are those with annual debit account turnover on the main business account of over £25 million.
 (c) Small and medium-sized enterprises are businesses with annual debit account turnover on the main business account of equal to or less than £25 million.

Chart 2.12 Net corporate bond issuance picked up in Q2
Net external finance raised by UK private non-financial corporations^(a)



(a) Includes sterling and foreign currency funds from UK MFIs and capital markets.
 (b) As component series are not all seasonally adjusted, their sum may not equal the total.
 (c) Includes stand-alone and programme bonds.
 (d) Not seasonally adjusted.

Some of this recent weakness may reflect the effects of uncertainty around Brexit. As set out in the *May Report*, results from the Bank's Decision Maker Panel Survey and *Deloitte CFO Surveys* at that time suggested that Brexit was becoming less of a drag on business investment growth. But respondents to the 2018 Q2 *Deloitte CFO Survey* again ranked Brexit as the top risk facing their businesses, and three quarters of respondents expected Brexit to lead to a deterioration in the business environment in the long term, the highest proportion since the referendum.

Weak demand for investment appears to have been reflected in slowing growth of bank lending to companies since mid-2016 (Chart 2.11). There are also signs that financial conditions have tightened slightly since May which might have weighed on lending, although conditions remain accommodative overall (Section 1). Growth in lending to small and medium-sized enterprises has been slower than for larger companies. Results from the Q2 *Credit Conditions Survey*, however, suggested that demand for bank lending from small businesses rose significantly in that quarter.

Larger corporates can also access other sources of finance, such as the corporate bond market. Net corporate bond issuance was strong in Q2 (Chart 2.12). Additionally, the volume of leveraged loans has risen rapidly since early 2017. But over that period, almost all of those loans have been for either balance sheet restructuring or mergers and acquisitions and so are unlikely to have provided much direct support to business investment growth.

Business investment growth is expected to have picked back up in Q2 and to remain a little above its past average rate in coming quarters (Table 2.B), but subdued compared with previous recoveries. That is consistent with survey measures of investment intentions. Investment is likely to remain sensitive to developments in Brexit and the prospects for global growth.

2.6 Government

The MPC's projections are conditioned on the Government's tax and spending plans detailed in the March 2018 Spring Statement. Under those plans, public sector net borrowing is projected to fall to 1.3% of GDP by 2020/21, from 2.3% of GDP in 2017/18.

Box 4

Household balance sheets

Household real income growth has been weak due to the rise in import prices following sterling's depreciation around the time of the EU referendum and subdued nominal pay growth. Real incomes have been broadly flat since the start of 2016, compared to average quarterly growth of ½% during 2012–15. Consumption growth has not slowed to the same extent as real income growth and, as a result, the saving ratio has fallen to historically low levels (**Chart 2.4**).

A key influence on household spending will be the pace at which households might seek to build savings in coming years. That will depend, in part, on the strength of household balance sheets. Households may be willing to save less if they have already built up a buffer stock of precautionary saving, or if the value of their net wealth rises. But they might save more if they have a low stock of saving and are worried about their ability to borrow to support consumption, in case of future loss of income. This box explores developments in household balance sheets and discusses the potential implications for savings.

Net wealth and household saving

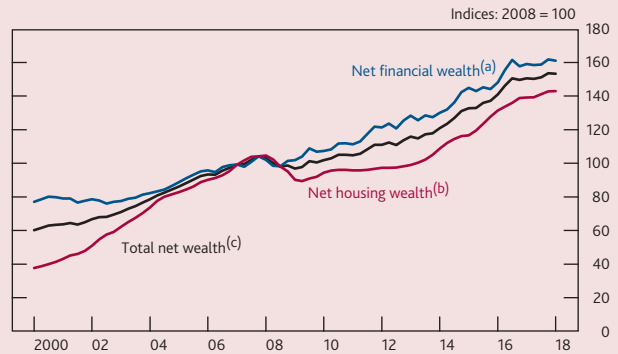
The stock of households' financial and housing assets is considerably larger than their stock of debt. That means, in aggregate, the household sector holds significant net wealth. Developments in household balance sheet positions will reflect patterns of asset and liability accumulation as well as changes in asset values.

In the decade prior to the financial crisis, net wealth rose steadily (**Chart A**) and the saving ratio was broadly stable. But during the crisis, wealth fell, driven mainly by a fall in house prices, and the saving ratio rose. Some of that rise in the saving ratio may have reflected households increasing saving to offset the fall in wealth. Some of it is also likely to have reflected the sharp tightening in credit conditions and higher uncertainty associated with rises in unemployment over that period.

Since the crisis, net financial wealth has risen by around 60% (**Chart A**), credit conditions have loosened, unemployment has decreased and the saving ratio has fallen back. In particular, since the end of 2015, net financial wealth has risen by 12%, in part as the fall in sterling associated with the EU referendum has boosted the value of equities of companies with foreign earnings (Section 1), and the saving ratio has fallen further, to historically low levels.

Chart A Net wealth has risen since the financial crisis

Net household wealth



Sources: IHS Markit, Nationwide, ONS and Bank calculations.

- (a) Financial wealth less unsecured debt. Not seasonally adjusted.
 (b) Housing wealth less secured debt. Housing wealth from 2017 onwards is an estimate based on growth in UK house prices according to the average of the quarterly Halifax/Markit and Nationwide house price indices. Not seasonally adjusted.
 (c) Sum of net financial and net housing wealth.

The extent to which rises in wealth boost consumption and lower the saving ratio is uncertain and can vary over time. Bank staff estimate that, on average over the past, a 10% rise in the real value of households' financial assets has boosted consumption by around 0.5%. On that basis, the rise in real net financial wealth since the end of 2015 could have been associated with around a ½ percentage point fall in the saving ratio.

In addition to the rise in financial wealth, housing wealth has risen by around 12% since the end of 2015 and by around 40% since the crisis (**Chart A**). Rises in the value of housing wealth will increase the value of housing equity that households can use as collateral against which to borrow. As set out in the box on pages 18–19 of the *November 2016 Report*, Bank staff estimated that for a 10% rise in housing wealth, this collateral channel was associated with a boost to the level of consumption averaging around 0.5%.

The distribution of assets and debt across households

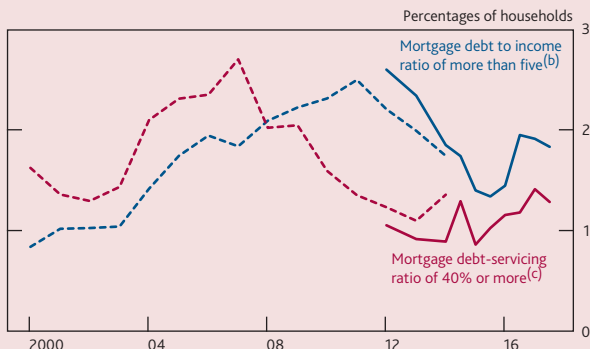
The distribution of assets and liabilities across households can also matter for consumption. In particular, households with higher levels of debt tend to adjust their spending more significantly in response to shocks to their income.⁽¹⁾

Results from the latest Bank/NMG survey suggest that the proportions of households with high mortgage debt to income ratios or high debt-servicing ratios (DSRs) have risen slightly since 2016, but remain significantly lower than during the crisis (**Chart B**). The proportion of households with high DSRs remains below its pre-crisis average. In addition, the savings of households with high DSRs appear to have risen since 2014 (**Chart C**), which suggests that those households are now likely to be more resilient to shocks.

(1) For more detail see Bunn, P and Rostom, M (2014) 'Household debt and spending', *Bank of England Quarterly Bulletin*, 2014 Q3.

Chart B The proportion of households with high mortgage debt relative to income is lower than during the crisis

Proportions of households with high mortgage debt relative to gross income and a high mortgage DSR^(a)

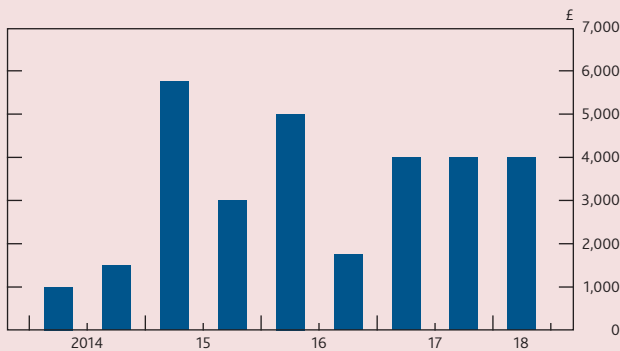


Sources: British Household Panel Survey (BHPS), Living Costs and Food (LCF) Survey, NMG Consulting survey, Understanding Society Survey (USS) and Bank calculations.

- (a) Calculated using LCF Survey (for debt to income ratios) and BHPS and USS (for debt-servicing ratios) from 1997 to 2014, shown in the dashed lines, and NMG Consulting survey from 2012 onwards, shown in the solid lines.
- (b) Debt to income calculated as gross mortgage debt as a percentage of a four-quarter moving sum of disposable income.
- (c) Mortgage DSR calculated as total mortgage payments as a percentage of pre-tax income.

Chart C Households with high mortgage DSRs have more savings than in previous years

Median savings of households with high mortgage DSRs^(a)



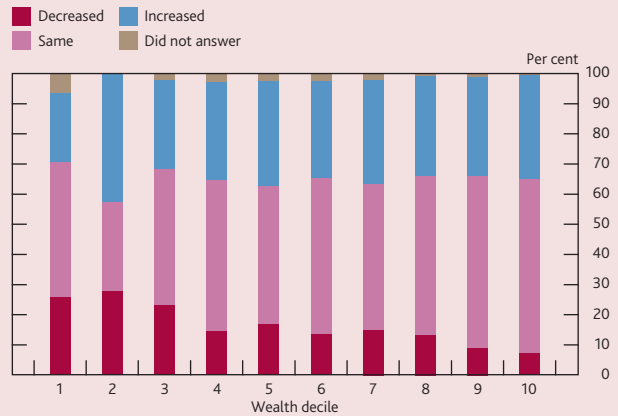
Sources: NMG Consulting survey and Bank calculations.

- (a) Mortgage DSR calculated as total mortgage payments as a percentage of pre-tax income. High DSRs defined as 40% or greater. Savings calculated using answers to the following questions in the NMG survey: 'How much do you (and all other members of your household) currently have in total, saved up in savings accounts? Please include bank/building society accounts or bonds, cash ISAs, and NS&I account/bonds.'; and 'Excluding money in savings accounts, how much do you (and all other members of your household) currently have in total, saved up in other investments such as stocks, shares and unit trusts?'

Results from the latest Bank/NMG survey also show that more households with high levels of net financial wealth have maintained or increased their spending over the past 12 months than less wealthy households (**Chart D**). While those households may have seen faster rises in their incomes, it could suggest that having stronger balance sheets has also supported their spending.

Chart D More households with high levels of wealth have maintained or increased spending than less wealthy households

Changes in household spending over the past 12 months by wealth decile^(a)



Sources: NMG Consulting survey and Bank calculations.

- (a) Wealth decile defined by total gross financial wealth. Higher deciles indicate higher levels of wealth. Changes in household spending calculated using responses to the question in the NMG survey: 'How has your household changed its spending compared with a year ago? Please include all your spending on goods and services, but exclude money put into savings or used to repay mortgages, overdrafts, credit cards and other loans.'

Conclusion

In aggregate, household balance sheets look relatively strong compared to the past as the stock of both financial and housing assets has risen considerably faster than the stock of debt. That may be supporting the current low saving rate, allowing households to maintain consumption growth even as real income growth has slowed.

Alongside that, low unemployment and accommodative financial conditions should limit households' perceived need to build up further precautionary savings in aggregate. As a result, consumption growth is expected to remain in line with real income growth over the next few years such that the saving ratio remains broadly flat (Section 5).

3 The labour market and pay

Labour demand growth remains robust and a very limited degree of slack is left in the economy. Reflecting the tightening in the labour market, indicators of pay growth have been strengthening and pay growth is projected to rise slightly further. That, combined with subdued productivity growth, is contributing to rising domestic cost pressures.

Chart 3.1 The unemployment rate is projected to fall to 4.0% in Q3

Unemployment rate and Bank staff's near-term projection^(a)

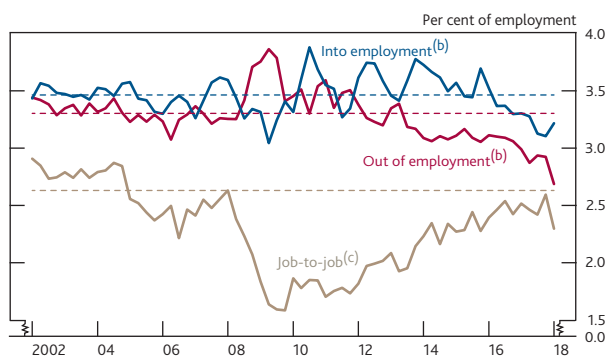


Sources: ONS and Bank calculations.

(a) The beige diamonds show Bank staff's central projections for the headline unemployment rate for the three months to March, April, May and June 2018 at the time of the *May Report*. The red diamonds show the current staff projections for the headline unemployment rate for the three months to June, July, August and September 2018. The bands on either side of the diamonds show uncertainty around those projections based on one root mean squared error of past Bank staff projections for the three-month headline unemployment rate.

Chart 3.2 Outflows from employment have been low relative to the past

Flows into and out of employment, and job-to-job flows^(a)



Sources: ONS and Bank calculations.

(a) Dashed lines are averages from 2002 to 2007. Proportions of people in employment aged 16–69. Seasonally adjusted by Bank staff.
 (b) Proportion of people who reported having moved to or from employment in the past three months. Two-quarter moving averages.
 (c) Proportion of people who reported being in a job three months ago and report being in a job for less than three months.

Most indicators suggest that labour demand growth has remained robust and that the labour market is currently tight (Section 3.1). Pay growth has risen over the past year (Section 3.2) and tightness in the labour market is expected to push up pay growth slightly further in coming years (Section 5). In addition to stronger pay growth, unit labour cost growth has been boosted by temporarily weak growth in productivity (Section 3.3). Over coming years, the projected further strengthening in wage growth raises domestic inflationary pressures (Section 4).

3.1 Labour market tightness

During the financial crisis, output fell and unemployment rose, as companies reduced hiring and increased redundancies. The number of additional hours people wanted to work also rose, perhaps in response to a squeeze in their real incomes. Taken together, these factors led to a substantial degree of spare capacity opening up in the labour market over this period. This, in turn, was a significant factor behind subdued wage growth during 2009–15 (Section 3.2).

That spare capacity has now largely been absorbed and the MPC judges that very limited slack remains (Section 5). Relative to expectations at the time of the *May Report*, there has been little news in labour market quantities. The participation rate and employment rate were slightly higher, and average hours slightly lower, than expected. The unemployment rate was 4.2% in the three months to May (Chart 3.1). This was broadly in line with the MPC's judgement of the equilibrium rate of unemployment of 4¼%,⁽¹⁾ suggesting little scope for unemployment to fall further without generating excess wage pressure.

Broader measures also suggest that there is limited spare capacity in the labour market. In aggregate, the total net additional hours that people report wanting to work, over and above the hours they usually work each week, has fallen to around zero. As discussed in previous *Reports*, the proportion

(1) For further discussion see Box 4 of the *February 2018 Inflation Report*.

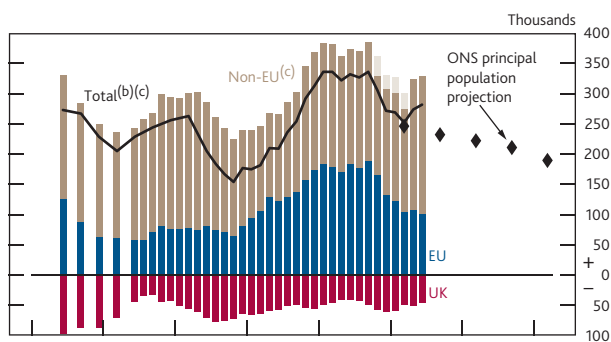
Table 3.A Labour demand growth remains robust
Selected measures of labour demand and labour market tightness

	Quarterly averages									
	2000–07	2008–09	2010–12	2013–14	2015	2016	2017	2018 Q1	2018 Q2	
Change in employment (thousands)^(a)	70	-59	67	130	147	75	80	197	85	
<i>of which, employees</i>	55	-67	32	106	110	40	86	270	<i>n.a.</i>	
<i>of which, self-employed and other^(b)</i>	16	7	35	24	36	35	-6	-73	<i>n.a.</i>	
Surveys of employment intentions^(c)										
Agents ^(d)	0.8	-1.7	0.3	0.9	1.0	0.1	0.3	0.4	0.2	
BCC ^(e)	19	-3	8	26	25	21	22	23	24	
CBI ^(e)	3	-20	-3	17	18	17	15	18	11	
REC ^(f)	58	44	56	63	64	59	63	61	62	
Vacancies to labour force ratio^(g)	2.09	1.70	1.48	1.85	2.23	2.25	2.36	2.42	2.44	
Redundancies to employees ratio^(h)	0.63	0.79	0.60	0.46	0.41	0.43	0.38	0.35	0.35	
Marginal attachment ratio⁽ⁱ⁾	5.77	5.64	5.85	5.68	5.60	5.36	4.99	4.86	4.72	
Surveys of recruitment difficulties^(c)										
Agents ^(j)	1.5	-2.5	-1.1	0.4	2.0	1.3	2.0	2.6	2.5	
BCC ^(k)	61	55	51	57	66	62	67	62	64	
CBI, skilled ^(l)	27	15	16	23	34	32	32	30	29	
CBI, other ^(l)	8	2	2	3	8	8	10	10	9	

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

- (a) Changes relative to the previous quarter. Figure for 2018 Q2 is Bank staff's projection, based on data to May.
 (b) Other comprises unpaid family workers and those on government-supported training and employment programmes classified as being in employment.
 (c) Measures for the Bank's Agents (split by manufacturing and services for employment intentions), the BCC (non-services and services) and CBI (manufacturing, financial services and business/consumer/professional services); employment intentions also include distributive trades are weighted together using employee job shares from Workforce Jobs. BCC data are not seasonally adjusted. Agents data are last available observation for each quarter.
 (d) The scores are on a scale of -5 to +5, with positive scores indicating stronger employment intentions over the next six months relative to the previous three months.
 (e) Net percentage balance of companies expecting their workforce to increase over the next three months.
 (f) Quarterly average. Recruitment agencies' reports on the demand for staff placements compared with the previous month. A reading above 50 indicates an increase on the previous month and below 50 indicates a decrease.
 (g) Vacancies as a percentage of the workforce, calculated using rolling three-month measures. Excludes vacancies in agriculture, forestry and fishing. Figure for 2018 Q2 shows vacancies in the three months to June relative to the size of the labour force in the three months to May. Vacancies data start in 2001 Q2.
 (h) Redundancies as a percentage of total LFS employees, calculated using rolling three-month measures. Figure for 2018 Q2 is for the three months to May.
 (i) Number of those aged 16–64 who say they are not actively looking for work but would like a job, as a percentage of the 16–64 population. Figure for 2018 Q2 is for the three months to May.
 (j) The scores are on a scale of -5 to +5, with positive scores indicating greater recruitment difficulties in the most recent three months relative to normal.
 (k) Percentage of respondents reporting recruitment difficulties over the past three months.
 (l) Net percentage of respondents expecting skilled or other labour to limit output/business over the next three months (in the manufacturing sector) or over the next twelve months (in the financial services and business/consumer/professional services sectors).

Chart 3.3 Net migration is projected to fall from current levels
Decomposition of net inward migration by nationality^(a)



- (a) Rolling four-quarter flows. Data are half-yearly to December 2009 and quarterly thereafter, unless otherwise stated. Figures by nationality do not sum to the total prior to 2012.
 (b) Data are half-yearly to December 2011 and quarterly thereafter.
 (c) Adjusted to include the ONS's illustrative revised trend for the inward migration of non-EU students which accounts for an unusual pattern in the International Passenger Survey. That adjustment is represented by the faded non-EU bars.

of the population who report that they would like a job but are not currently seeking one — the marginal attachment ratio — has fallen sharply in recent years (Table 3.A), suggesting that there is no significant spare capacity among those not actively looking for a job. The number of vacancies per person in the labour force — which is an indicator of the difficulty with which employers would be able to fill jobs — is above its pre-crisis average. The rate at which those already in employment are switching to new jobs has risen to close to pre-crisis rates, although it softened in Q1 (Chart 3.2). And survey measures of firms' recruitment difficulties are at or above pre-crisis levels.

With little slack in the labour market, growth in the size of the workforce will come mainly from population growth. The MPC's forecasts assume that the population evolves in line with the ONS's latest principal population projection, published in October 2017. A key influence on population growth is net migration to the UK. In the year to December 2017, net inward migration rose to 282,000, slightly above the ONS projection. Within this, net migration from the EU has slowed since 2016 H1. The ONS projects net inward migration to fall somewhat in coming years (Chart 3.3), reducing population growth slightly.

The labour market is expected to tighten further in the near term. Employment has continued to grow solidly (Table 3.A) and labour demand growth appears robust. The strength of employment growth over the past few years has been associated with lower flows out of employment rather than higher flows into it (Chart 3.2). Within this, the redundancy rate is around half its pre-crisis average. Many survey indicators of employment intentions remain above their past averages and the number of vacancies remains high. As a result, the unemployment rate is projected to fall to 4.0% in 2018 Q3 (Chart 3.1), broadly as anticipated at the time of the May Report (Table 3.B).

3.2 Developments in pay growth

A tightening labour market and lower unemployment is typically associated with higher pay growth (Chart 3.4) as it becomes more difficult for firms to recruit and retain staff. Whole-economy regular average weekly earnings (AWE) growth — which excludes bonuses — rose to 2.7% in the three months to May from 2.0% a year earlier, broadly as anticipated.

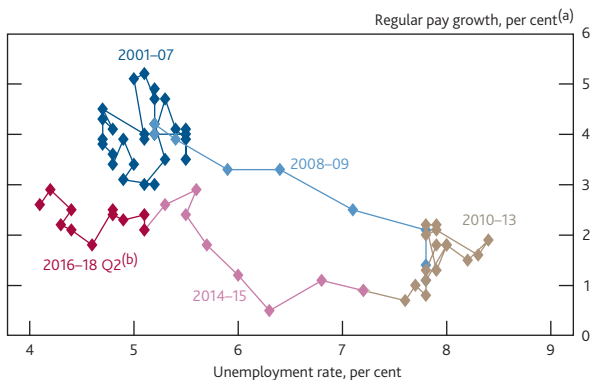
Wage growth remains subdued relative to its past average, though much of that weakness is likely to reflect lower productivity growth than in the past. Labour productivity — the amount of output produced per worker — is a significant influence on the amount of revenue that companies generate, and therefore what they can afford to pay their

Table 3.B Monitoring the MPC’s key judgements

Developments anticipated in May during 2018 Q2–Q4	Developments now anticipated during 2018 Q3–2019 Q1
Unemployment	Broadly unchanged
• Unemployment rate to fall to 4% by the end of the year.	• Unemployment rate to average around 4%.
Participation	Broadly unchanged
• Participation rate to remain just under 63¾%.	• Participation rate to average 63¾%.
Average hours	Broadly unchanged
• Average weekly hours worked to fall slightly to a little under 32.	• Average weekly hours worked to remain a little under 32.
Productivity	Broadly unchanged
• Quarterly hourly labour productivity growth to average just over ¼%.	• Quarterly hourly labour productivity growth to average around ¼%.
Wages and unit labour costs	Broadly unchanged
• Four-quarter growth in whole-economy AWE regular pay to average around 2¾%.	• Four-quarter growth in whole-economy AWE regular pay to average around 2¾%.
• Four-quarter growth in whole-economy unit labour costs to average around 2¾%.	• Four-quarter growth in whole-economy unit labour costs to average around 2¾%.
• Four-quarter growth in whole-economy unit wage costs to average around 2½%.	• Four-quarter growth in whole-economy unit wage costs to average around 2½%.

Chart 3.4 Wage growth has remained subdued as the unemployment rate has fallen

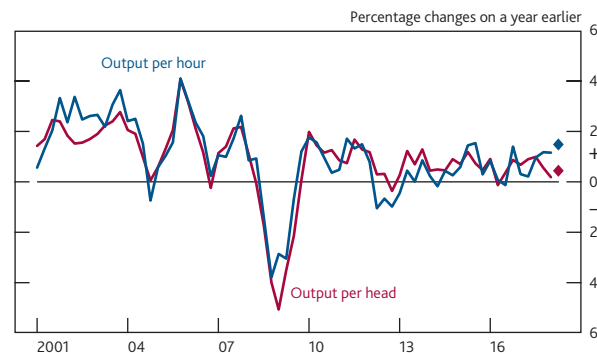
Wage Phillips curve: wage growth and unemployment



(a) Whole-economy AWE total pay excluding bonuses and arrears of pay. Percentage change on a year earlier.
 (b) Diamond for 2018 Q2 shows Bank staff’s projections, based on data to May.

Chart 3.5 Growth in output per head has remained subdued

Measures of labour productivity^(a)



Sources: ONS and Bank calculations.

(a) Output is based on the backcast for the final estimate of GDP. Diamonds show Bank staff’s projections for 2018 Q2, based on data to May.

employees. Therefore, while wage and productivity growth can deviate in the short run, they have tended to move together over time. Productivity fell during the financial crisis and its growth has remained subdued since then (Chart 3.5), particularly relative to its pre-crisis trend. Four-quarter growth in output per head is expected to have remained weak in 2018 Q2. Average hours worked tend to be volatile from one quarter to another, which in turn increases the volatility in output per hour relative to output per head. Indeed, a sharp fall in average hours worked since 2017 H1 has led to a divergence between these two measures of productivity growth.

Because productivity growth tends eventually to be fully reflected in wage growth, slower productivity growth can probably account for around half of the shortfall in average wage growth since 2010, relative to its pre-crisis average (Chart 3.6). Productivity growth is projected to pick up a little, reaching around 1¼% by 2019 — which will support some rise in wage growth — but it is expected to remain below its past average rate (Section 5).

The remaining weakness in wage growth is likely to be mainly due to labour market slack. During much of 2008–17, the unemployment rate was higher than the MPC’s judgement of the equilibrium rate of unemployment. While labour market slack has now largely been absorbed, it can take time for that to be fully reflected in wage growth.

Data from the Annual Survey of Hours and Earnings suggest that pay rises for those switching jobs had increased to pre-crisis rates, both for those moving to a new employer and for those moving to a new role with the same employer (Chart 3.7). Pay rises for those staying in the same job had remained subdued, however, and would need to increase to support a broader rise in labour cost pressures. These data are only available with a lag and the most recent relate to April 2017. Since then, AWE growth has risen and so could suggest that pay rises have broadened out. Recent evidence from the Bank’s Agents suggests that recruitment and retention pressures have pushed up pay growth over the past year (see Box 5). Contacts that reported recruitment and retention having become harder over the past 12 months had increased average pay growth by more than those who reported the level of difficulty as unchanged.

3.3 The outlook for pay and labour costs

Annual growth in average wages excluding bonuses of 2.7% in the three months to May 2018 was higher than in 2016, when growth was around 2½%, and higher still than the average of around 1¾% a year during 2010–15. It is projected to remain around 2¾% in the second half of the year, broadly unchanged since the *May Report*.

Box 5

Agents' update on business conditions

The Bank of England's Agents have a long-standing role in providing economic intelligence to the Bank's policymaking committees from their regular meetings with businesses. Some of the key information from Agents' contacts considered by the Monetary Policy Committee at its August meeting is highlighted in this box. This replaces the *Agents' summary of business conditions*, previously released a week after the *Inflation Report*, which will no longer be published.⁽¹⁾ A comprehensive quarterly report from the Agents on business conditions will be published alongside the MPC decision in non-*Inflation Report* months.

According to the Bank's Agents, annual consumer spending growth rose slightly, supported somewhat by the warmer weather and the football World Cup.⁽²⁾ The underlying picture remained one of modest growth. Retailers reported subdued demand growth, especially for white goods and homewares, due to weak real income growth and housing market activity.

There was solid growth in business services activity, particularly relating to mergers and acquisitions, company voluntary agreements and Brexit advice.

Growth in domestic manufacturing output eased slightly but remained above its long-run average. Companies in supply chains for consumer goods faced headwinds from weaker demand growth, especially for cars and other big-ticket items, but demand for manufactured components from the oil and gas sector improved. Growth in manufacturing export volumes also eased slightly, but remained above average, and global demand was firm for aerospace, capital equipment and construction materials.

Construction output growth edged up, but remained sluggish. There was some catch-up following weather-related delays in 2018 Q1. However, the recent hot weather also caused challenges, for example through health and safety requirements or difficulties working with some materials. Many contacts faced capacity constraints.

Investment intentions for the next 12 months continued to be depressed by economic and political uncertainty. Contacts' references to uncertainty had picked up, with many related to concerns around Brexit. UK-based subsidiaries of foreign-owned companies reported holding back investment, and firms with export markets or with international supply chains were reluctant to expand capacity until there was more clarity on future EU market access.

Recruitment difficulties had intensified. Average pay settlements were a little higher than a year ago, in a range of 2½%–3½%. Growth in total labour costs picked up slightly,

partly as a result of the increase in employers' pension auto-enrolment contributions. Increases in non-discretionary labour costs were reducing the scope for across-the-board pay rises for some companies.

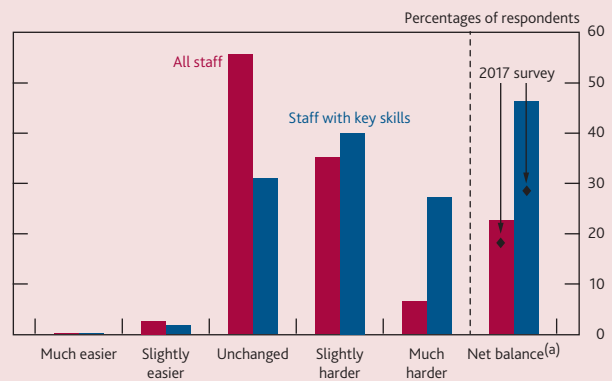
Agents' survey on the labour market

In June and July, the Agents surveyed business contacts about difficulties in recruiting and retaining staff.⁽³⁾ They asked companies what actions they were taking to address these issues, including if there was any impact on pay growth in 2018.

The results suggest that companies found it more difficult to recruit and retain staff than last year, with around two thirds of respondents saying it had become harder to recruit and retain staff with key skills and around 40% reporting increased difficulties relating to staff for any positions (**Chart A**).

Chart A Recruitment and retention difficulties have increased on balance

Change in recruitment and retention difficulties compared to a year ago



(a) The net percentage balance is the difference between the weighted balance of companies reporting that recruitment and retention had become harder or easier than a year ago. Half weight was given to those that responded 'slightly harder' or 'slightly easier', and full weight was given to those that responded 'much harder' or 'much easier'.

In response to rising recruitment and retention pressures, the most frequent action taken was to increase pay (**Chart B**). A greater proportion of firms increased pay for key existing staff than for new recruits or existing staff more generally. Contacts also reported increasing spending on recruitment, keeping vacancies open for longer and increasing investment in automation.

Contacts who had found recruitment and retention harder than a year ago had increased pay by more than those who reported the level of difficulty as unchanged, and had raised pay growth, compared with 2017, by more on average (**Chart C**). This was true of pay for both key skill positions and more broadly.

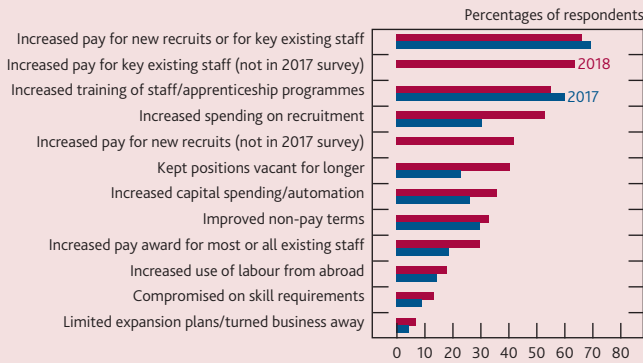
(1) The *Agents' scores* will continue to be published on the Bank of England website.

(2) This section covers intelligence gathered between early June and mid-July. References to activity generally relate to the past three months compared with a year earlier.

(3) The survey was conducted between 4 June and 11 July. Responses were received from 370 companies, employing around 470,000 people.

Chart B Recruitment and retention difficulties have pushed up pay

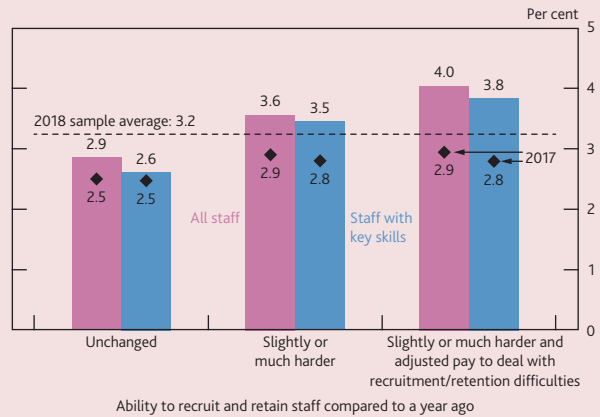
Changes made as a result of recruitment and retention difficulties^(a)



(a) Companies were asked 'Have you made any changes as a result of recruitment and retention challenges?' Contacts were then asked to select which factors they had changed as a result of those challenges.

Chart C Firms with greater recruitment and retention difficulties have raised pay growth by more than those that reported no change

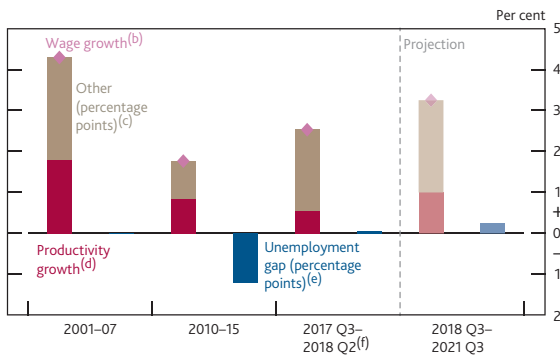
Annual pay growth for given changes in recruitment and retention difficulties^(a)



(a) Companies were asked for the change in their average wage bill per head in 2018 compared to 2017, and in 2017 compared to 2016.

Chart 3.6 Subdued wage growth is partly due to weaker productivity growth

The unemployment gap and stylised decomposition of average wage growth^(a)

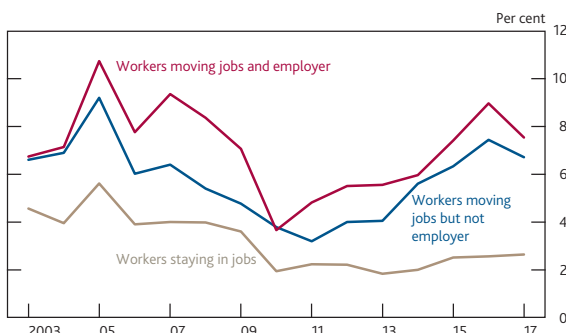


Sources: ONS and Bank calculations.

- (a) Faded bars/diamonds are projections. The stylised wage decomposition assumes a one-for-one relationship between productivity growth and wage growth over these periods.
- (b) Annual whole-economy total AWE growth.
- (c) Difference between wage growth and productivity growth.
- (d) Whole-economy productivity growth per head, based on the backcast of the final estimate of GDP.
- (e) Difference between the unemployment rate and Bank staff's estimate of the medium-term equilibrium unemployment rate.
- (f) Data for 2018 Q2 are Bank staff's projections, based on data to May.

Chart 3.7 Pay growth has recovered by more for those switching jobs

Median annual growth rates of pay^(a)



Sources: Annual Survey of Hours and Earnings and Bank calculations.

(a) Pay growth is median annual growth rate in April. Based on hourly gross earnings obtained by dividing gross pay in the reference week by total hours worked. Workers moving jobs are defined as workers in employment in consecutive years in a different job. Workers moving employers are defined as workers in employment in consecutive years with a different employer.

Private sector regular pay growth has also strengthened, to a little under 3% in recent months. Other indicators of private sector pay pressures have also risen. Private sector settlements data are consistent with an increase in median pay growth of around 0.5 percentage points relative to a year ago. The Bank's Agents' measure of average growth in labour costs has picked up in recent quarters (Chart 3.8). The REC pay survey, which is a measure of the pay growth of new recruits, also implies a strengthening in pay growth.

In the public sector, AWE growth has picked up notably over the past year, although it softened slightly in the three months to May. Excluding bonuses, public sector pay growth has risen from around 1½% to 2¼% — having been somewhat more subdued than private sector pay growth since 2014 (Chart 3.9).

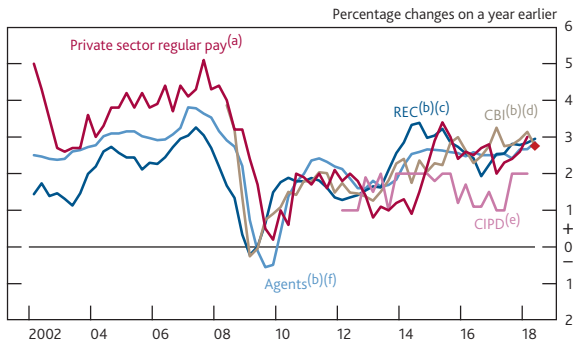
The 1% cap on public sector pay awards has been lifted from the 2018/19 pay round, which should contribute further to public sector pay growth. The MPC's forecasts are conditioned on Office for Budget Responsibility (OBR) projections for public sector pay growth, which allow for the lifting of the 1% pay cap.⁽²⁾ Since the OBR forecast was published, a number of public sector pay agreements for 2018/19 have been announced, as well as a multi-year agreement for the NHS, which could boost public sector pay slightly further. Following the next Budget in the autumn, the MPC's forecast will incorporate updated OBR projections that include an estimate of the effects of these announcements.

Public sector pay rises will have a direct effect on whole-economy pay growth, as public sector employment constitutes around one sixth of overall employment. There may also be indirect effects, in part as some private sector companies use public sector settlements as a benchmark when

(2) *Economic and Fiscal Outlook*, March 2018, Office for Budget Responsibility.

Chart 3.8 Indicators of pay growth have firmed over the past year

Private sector regular pay and survey indicators of pay growth

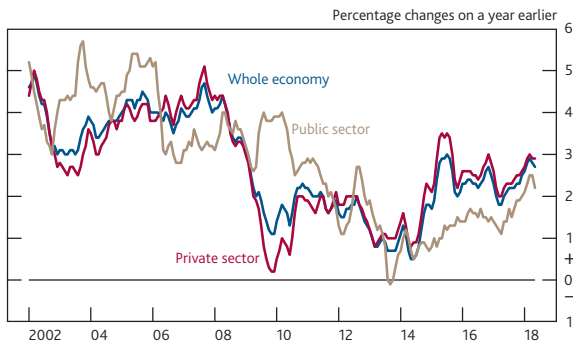


Sources: Bank of England, CBI, Chartered Institute of Personnel and Development (CIPD), KPMG/REC/IHS Markit, ONS and Bank calculations.

- (a) Private sector AWE total pay excluding bonuses and arrears of pay. Diamond for 2018 Q2 shows Bank staff's projection, based on data to May.
- (b) Scaled to match the mean and variance of private sector regular pay growth since 2008 Q2.
- (c) Produced by weighting together survey indices for the pay of permanent and temporary new placements using employee job shares; quarterly averages.
- (d) Measures of expected pay for the year ahead. Produced by weighting together responses for manufacturing, distributive trades, business/consumer/professional services and financial services using employee job shares. Data for financial services are only available since 2009 Q1, and other sectors since 2008 Q2.
- (e) Pay increase intentions excluding bonuses over the coming year. Data only available since 2012 and are to 2018 Q1.
- (f) Quarterly averages for manufacturing and services weighted together using employee job shares. The scores refer to companies' labour costs over the past three months compared with the same period a year earlier.

Chart 3.9 Wage growth has picked up in the private and public sectors over the past year

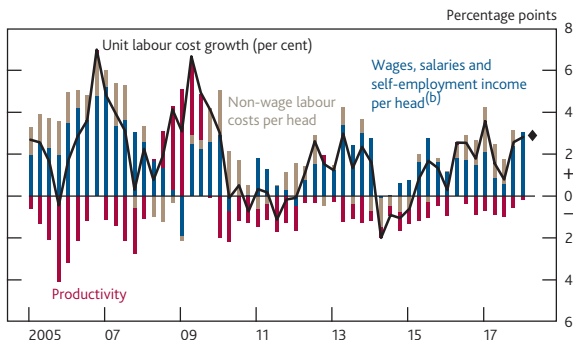
Regular pay by sector^(a)



(a) AWE total pay excluding bonuses and arrears of pay.

Chart 3.10 Unit labour cost growth has been temporarily boosted by weak productivity growth

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



Sources: ONS and Bank calculations.

- (a) Whole-economy labour costs divided by real GDP, based on the backcast of the final estimate of GDP. The diamond shows Bank staff's projection for 2018 Q2.
- (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.

negotiating pay agreements, and in part as private sector companies may have to offer higher salaries in response to recruit and retain staff. Empirically, while there is some evidence for a short-term influence of public sector settlements on those in the private sector, there is little empirical evidence for a significant long-term influence.⁽³⁾

Over the next few years, whole-economy pay growth is projected to rise to around 3½% as productivity growth rises slightly and the tightness of the labour market puts upward pressure on wage growth (Section 5).

For inflationary pressures, growth in unit labour costs is more relevant than wage growth alone. This depends on how fast wages and other costs of labour are rising relative to productivity. As explained above, part of the weakness in wage growth in recent years has been driven by weak productivity growth, and as such, unit labour cost (ULC) growth has been less subdued (Chart 3.10).

Non-wage labour costs, such as pension contributions, also affect labour cost growth. These costs boosted ULC growth in 2016–17, in part due to the phased introduction of auto-enrolment of employees into pension schemes and the abolition of contracting out of the state pension. The minimum employer contribution to pension schemes under auto-enrolment rose in April, and is set to rise further over the next year, contributing a little to overall ULC growth.

Rising wage growth means that ULC growth is projected to average around 2¼% in coming years, a continuation of the gradual acceleration since the crisis. ULC growth averaged ½% during 2010–15 and 1¾% in 2016. Recently, ULC growth has picked up further, although it has been boosted by temporarily weak growth in output per head (Chart 3.10). In part that reflected a temporary dip in output growth in Q1 (Section 2) that was not mirrored in employment growth. As this effect diminishes, ULC growth declines a little from current rates, but remains higher than its average over the past few years, contributing to domestic cost and inflationary pressures (Section 4).

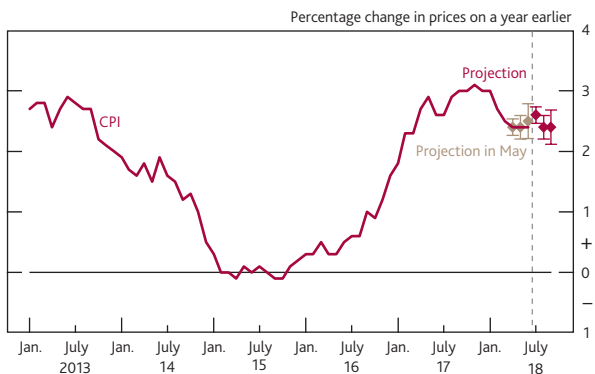
(3) See, for example, Dolton, P, Hantzsche, A and Kara, A (2018), 'Follow the leader? The interaction between public and private sector wage growth in the UK', National Institute of Economic and Social Research, *mimeo*, presented at the Royal Economic Society Annual Conference, March 2018.

4 Costs and prices

CPI inflation is expected to have risen temporarily in July, in part due to higher energy prices. As well as energy, the rise in import prices following the referendum-related depreciation of sterling has held inflation above the 2% target. Most of that rise in import prices has now been passed on to consumer prices and so inflation is projected to fall back towards the target. Domestic inflationary pressures are building to more normal levels. Inflation expectations remain broadly consistent with the target.

Chart 4.1 CPI inflation is expected to have risen to 2.6% in July, and then to fall back from August

CPI inflation and Bank staff's near-term projection^(a)

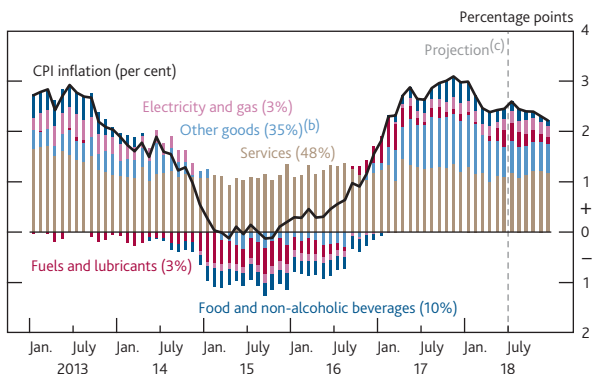


Sources: ONS and Bank calculations.

(a) The beige diamonds show Bank staff's central projection for CPI inflation in April, May and June 2018 at the time of the May *Inflation Report*. The red diamonds show the current staff projection for July, August and September 2018. The bands on each side of the diamonds show the root squared error of the projections for CPI inflation one, two and three months ahead made since 2004.

Chart 4.2 Inflation is expected to fall during 2018 H2 as the contribution from fuels diminishes

Contributions to CPI inflation^(a)



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

(a) Contributions to annual CPI inflation. Figures in parentheses are CPI basket weights in 2018 and may not sum to 100 due to rounding.
 (b) Difference between CPI inflation and the other contributions identified in the chart.
 (c) Bank staff's projection. Fuels and lubricants estimates use Department for Business, Energy and Industrial Strategy petrol price data for July 2018 and are then based on the August 2018 *Inflation Report* sterling oil futures curve, shown in **Chart 4.3**.

4.1 Consumer price developments and the near-term outlook

CPI inflation was 2.4% in 2018 Q2, as expected in the *May Report*. Within that, the June inflation figure was 0.1 percentage points lower than anticipated (**Chart 4.1**), as upside news in energy prices was more than offset by downside news in a small number of non-energy goods components such as clothing and footwear, recreational goods and food prices. Much of that downside news appears to have reflected an unusual degree of discounting during the month, which is expected to be largely temporary.

Inflation is expected to rise temporarily to 2.6% in July, before falling back again from August (**Chart 4.2**). That occurs as the contribution from external costs — energy prices and the pass-through of higher import prices following sterling's referendum-related depreciation — diminishes (**Section 4.2**). That decline is expected to be more gradual than projected in May, however, given the 2½% fall in sterling since the run-up to the *May Report* (**Section 1**).

In addition to external costs, the path for inflation will depend on domestic inflationary pressures. Those domestic pressures have been gradually picking up and are expected to remain firm (**Section 4.3**). In particular, labour cost pressures are strengthening (**Section 3**). Inflation expectations, which can influence wage and price-setting, remain consistent with inflation returning to the target in the medium term (**Section 4.4**).

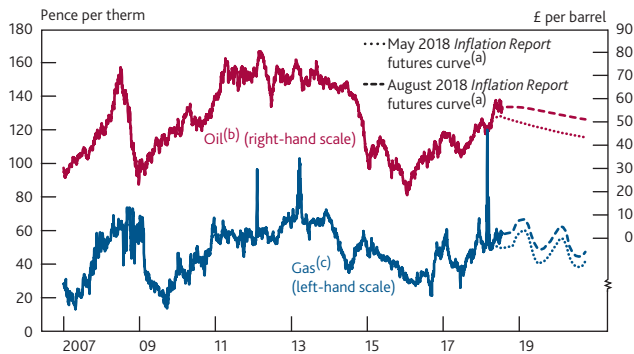
4.2 External cost pressures

Energy prices

Global energy prices affect CPI inflation directly through their impact on petrol prices and domestic gas and electricity bills. Coupled with this, there are indirect effects, for example on production and transport costs, which take longer to feed through to consumer prices.

Chart 4.3 Sterling wholesale energy prices have risen further in recent months

Sterling oil and wholesale gas prices



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

- (a) Fifteen working day averages to 2 May and 25 July 2018 respectively.
- (b) US dollar Brent forward prices for delivery in 10–25 days’ time converted into sterling.
- (c) One-day forward price of UK natural gas.

The sterling spot price of oil has risen by 7% since the *May Report* (Chart 4.3), primarily due to a depreciation of sterling against the US dollar. While there has been some volatility in recent months, the spot price has remained around 50% higher than in mid-2017. Changes in oil prices tend to be passed on to fuel prices, and therefore CPI inflation, relatively quickly. Accordingly, fuel prices are adding 0.4 percentage points to inflation at present (Chart 4.2). The oil futures curve — on which the MPC’s forecasts are conditioned — remains downward sloping, however. As such, the contribution from fuel prices to inflation falls over the next year, and turns slightly negative by mid-2019.

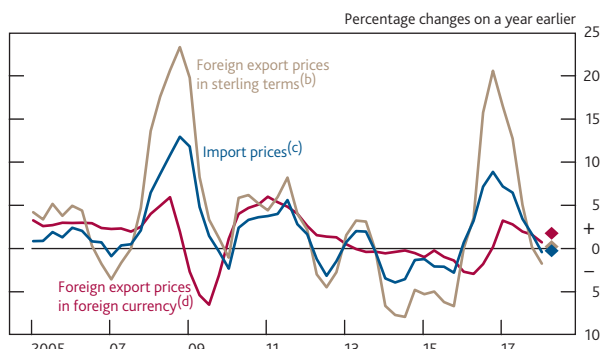
The gas futures curve has also risen, by around 15% since May (Chart 4.3), which will put upward pressure on retail gas and electricity prices. That follows rises in wholesale prices over the past year. The pass-through of wholesale gas prices to retail energy prices tends to take much longer than for changes in oil prices and the degree of pass-through varies over time. Rises in electricity and gas prices implemented by utility companies in recent months reflect earlier increases in wholesale prices being passed on with a lag.

Acting in the opposite direction, the announced cap on most standard variable tariffs (SVTs) — due to be implemented by the end of 2018 — may reduce some utility bills. There is currently uncertainty around the level of the cap, which will be determined by Ofgem, and therefore its precise implications for CPI. SVTs are the only tariffs currently captured in the CPI basket, so only changes in those tariffs will be directly reflected in CPI inflation.

Overall, the effects of higher wholesale gas costs on future household energy prices and of the tariff cap are expected broadly to offset each other. There is a large degree of uncertainty around the net impact and the timing, however, which could lead to some volatility in the contribution of energy to inflation over the next few years.

Chart 4.4 Import price inflation has fallen back from previously elevated rates

Import prices and foreign export prices^(a)



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

- (a) The diamonds show Bank staff’s projections for 2018 Q2.
- (b) Domestic currency non-oil export prices as defined in footnote (d), divided by the sterling effective exchange rate index.
- (c) UK goods and services import deflator excluding fuels and the impact of MTIC fraud.
- (d) Domestic currency non-oil export prices of goods and services of 51 countries weighted according to their shares in UK imports. The sample excludes major oil exporters.

Non-energy import costs

In addition to higher energy prices, the period of above-target inflation since 2016 can be accounted for by rises in the cost of non-energy imports facing UK companies and households. Those higher import costs (Chart 4.4) largely reflect the referendum-related depreciation of sterling. In addition, world export price inflation — changes in the foreign currency prices companies in other countries charge for their exports — has risen during this period, in part due to a pickup in oil and other commodity prices (Section 1), which are inputs into the production of many goods and services.

Changes in the sterling value of foreign export prices tend to feed through to import prices within a year. As such it is likely that the effect of sterling’s depreciation around the EU referendum on import prices has already come through.

Table 4.A Monitoring the MPC’s key judgements

Developments anticipated in May during 2018 Q2–Q4	Developments now anticipated during 2018 Q3–2019 Q1
Household energy prices • Electricity prices to rise 5¼% and gas prices 4½% by the end of 2018.	Broadly unchanged • Electricity and gas prices to be unchanged except for announced price rises.
Import prices • Non-fuel import prices to be broadly flat in the year to 2018 Q4. • Commodity prices to evolve in line with the conditioning assumptions.	Revised up • Non-fuel import price growth to rise to 2% in the year to 2019 Q1. • Commodity prices to evolve in line with the conditioning assumptions.
Inflation expectations • Indicators of medium-term inflation expectations to continue to be broadly consistent with the 2% target.	Broadly unchanged • Indicators of medium-term inflation expectations to continue to be broadly consistent with the 2% target.

Import prices are expected to have been broadly flat in the year to 2018 Q2 (Chart 4.4). Some pass-through from the recent depreciation in sterling, and the increase in foreign currency export prices (Section 1), are expected to push up import price inflation over the next few quarters (Table 4.A).

The rise in import prices since 2015 Q4 has in turn been passed on to consumer prices, although that pass-through has some way to run. That effect has been most apparent in the price of food and other goods (Chart 4.2), which tend to be more import-intensive. Non-energy goods inflation has slowed in recent months, and its contribution to CPI inflation is projected to fall slightly to 0.7 percentage points by the end of 2018 as the impact of sterling’s depreciation continues to diminish. That is consistent with responses to a recent survey by the Bank’s Agents on consumer demand. The effect of import prices on inflation is set to diminish further over the next couple of years (Section 5), albeit by slightly less than anticipated three months ago.

4.3 Domestically generated inflation

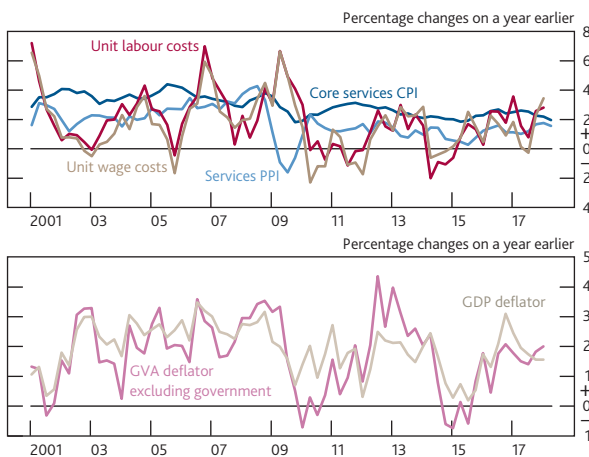
Inflation depends both on external cost pressures and on domestically generated inflation (DGI). DGI is influenced by the degree of spare capacity in the economy and, while it is not directly observable, there are a number of indicators that are closely linked to the concept. These include measures capturing labour costs — the largest domestic cost facing most companies — and the prices of services — which are generally provided domestically.

The degree to which wages and other labour costs affect inflation will depend on how fast they are rising relative to productivity — unit labour cost (ULC) growth (Section 3). Following the crisis, slack in the labour market weighed on wage growth and ULC growth was subdued (Chart 4.5). As slack diminished during 2016–17, ULC growth picked up. And in 2018 Q1 ULC growth picked up further, although it was boosted by temporarily weak productivity growth. Over coming years, the projected strengthening in wage growth is expected to push up domestic cost pressures relative to the past few years (Section 5).

In contrast to rising labour cost pressures, DGI as measured by services sector inflation has softened. One particular measure is inflation in the price of core services, which excludes components that are more likely to be related to tradable prices or government policy, such as airfares and education. That particular measure, which accounts for just over 40% of the CPI basket, fell to 2.0% in Q2, from an average of around 2½% during 2017 (Chart 4.5). That decline in part reflects previous erratic strength in a few components, such as coach fares and car insurance premiums, unwinding. In addition, services inflation is affected by external costs to some degree, as many service providers will use imported goods and services

Chart 4.5 Core services inflation has been subdued, but labour cost growth has picked up

Measures of domestically generated inflation^(a)



Sources: ONS and Bank calculations.

(a) Unit labour costs are whole-economy labour costs (including self-employment income) divided by real GDP, and unit wage costs are wages and salaries and self-employment income divided by real GDP; both based on the backcast of the final estimate of GDP. Core services CPI excludes airfares, package holidays, education and VAT; where Bank staff have adjusted for the rate of VAT there is uncertainty around the precise impact of those changes. All data are quarterly and up to 2018 Q1, except services PPI which are to 2018 Q2 and core services CPI which are quarterly averages of monthly data up to 2018 Q2.

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

Per cent									
	2000 (or start of series) to 2007 averages ^(b)	Averages since 2008	2015	2016	2017		2018		
					H1	H2	Q1	Q2	Q3 ^(c)
One year ahead inflation expectations									
Households^(d)									
Bank/GfK/TNS ^(e)	2.4	3.0	2.0	2.2	2.9	2.9	2.9	2.9	n.a.
Barclays Basix	2.8	2.7	1.5	1.9	2.3	2.5	2.5	2.4	n.a.
YouGov/Citigroup (Nov. 2005)	2.5	2.4	1.3	1.8	2.6	2.6	2.4	2.5	2.5
Companies (2008 Q2)^(f)	n.a.	1.8	0.4	1.6	2.6	2.3	3.7	2.3	n.a.
Financial markets (Oct. 2004)^(g)	2.6	2.8	2.5	2.8	3.5	3.3	3.0	3.1	3.2
Two to three year ahead expectations									
Households^(d)									
Bank/GfK/TNS (2009 Q1) ^(e)	n.a.	2.7	2.3	2.3	2.8	2.8	2.9	2.9	n.a.
Barclays Basix	3.2	3.0	1.9	2.3	2.9	2.9	3.0	2.9	n.a.
Professional forecasters (2006 Q2)^(h)	2.0	2.1	2.1	2.1	2.2	2.0	2.0	1.9	2.0
Financial markets (Oct. 2004)^(g)	2.8	3.0	3.0	3.0	3.4	3.3	3.3	3.3	3.3
Five to ten year ahead expectations									
Households^(d)									
Bank/GfK/TNS (2009 Q1) ^(e)	n.a.	3.2	2.8	3.1	3.3	3.5	3.4	3.6	n.a.
Barclays Basix (2008 Q3)	n.a.	3.7	3.1	3.4	3.9	4.1	4.1	4.0	n.a.
YouGov/Citigroup (Nov. 2005)	3.5	3.2	2.7	2.7	3.0	3.2	3.1	3.0	3.3
Financial markets (Oct. 2004)^(g)	3.0	3.4	3.3	3.2	3.4	3.4	3.4	3.4	3.4
Memo: CPI inflation	1.6	2.4	0.0	0.7	2.4	2.9	2.7	2.4	n.a.

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

(a) Data are not seasonally adjusted.

(b) Dates in parentheses indicate start date of the data series if after 2000.

(c) Financial markets data are averages to 25 July 2018. YouGov/Citigroup data are for July.

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

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

(f) CBI data for the distributive trade sector. Companies are asked about the expected percentage price change over the coming 12 months in the markets in which they compete. The 2018 Q1 data point was pushed up significantly by one response.

(g) Instantaneous RPI inflation one and three years ahead and five-year RPI inflation five years ahead, implied from swaps.

(h) Bank's survey of external forecasters. Inflation rate three years ahead.

as inputs. Some of the recent fall in services inflation will therefore reflect the diminishing effect of the past depreciation of sterling.

Subdued services inflation also in part reflects low rent inflation, which fell to 0.4% in June from around 3% in early 2016, and is expected to remain subdued in coming quarters. Rent inflation is less directly affected by slack in the economy or external cost pressures, and is more closely related to developments specific to the housing market, such as the weakness in the London market (Section 2). Around half of the decline since early 2016 can be accounted for by lower rents paid for social housing — property owned by local authorities or housing associations. That has largely reflected the Government's policy to reduce rents for most tenants in that sector by 1% a year from April 2016 until April 2020. Nonetheless, rents account for around 20% of the core services basket, so services inflation is expected to remain subdued and rise only gradually in coming months (Chart 4.2), despite the pickup in ULC growth.

4.4 Inflation expectations

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

The MPC monitors a range of indicators derived from financial market prices and surveys of households and companies to assess whether inflation expectations remain consistent with the target. Shorter-term indicators of inflation expectations picked up during 2016–17 as CPI inflation rose, and as inflation has fallen back some of those indicators have fallen a little alongside it (Table 4.B). Some longer-term household indicators have edged up a little since 2016, although they remain close to past averages and so appear to be consistent with CPI inflation returning towards the target. Overall, the MPC judges that inflation expectations remain well anchored.

5 Prospects for inflation

CPI inflation and activity have evolved broadly in line with the MPC's expectations at the time of the *May Report*. Inflation was 2.4% in June, above the target due to sterling's past depreciation and higher energy prices. Those external cost pressures are projected to dissipate over the forecast period, though at a slightly slower rate than projected in May following the further fall in the sterling exchange rate over the past three months. GDP growth appears to have recovered in Q2. UK demand is expected to continue to grow at a modest pace which, given subdued potential supply growth, is likely to be more than sufficient to use up the very limited degree of slack remaining in the economy. Conditioned on a path for Bank Rate that rises to 1.1% over the next three years, a small margin of excess demand is likely to emerge by late 2019 and to build thereafter, raising domestic inflationary pressures. Taken together with diminishing external pressures, CPI inflation is projected to decline towards the target, reaching 2% in the third year of the forecast period.

UK GDP growth is reported to have dipped to 0.2% in Q1, partly reflecting the temporary impact of adverse weather. But it is estimated to have recovered to 0.4% in Q2, as anticipated in the *May Report*.

Global GDP growth was slightly weaker than expected in Q2 and the outlook has moderated slightly over the past three months. Nevertheless, most indicators of global activity suggest that growth should remain relatively robust at above-potential rates (Key Judgement 1).

Along with accommodative financial conditions, relatively robust global growth is projected to support UK demand, particularly investment and net trade. Uncertainty around the United Kingdom's future trading arrangements continues to weigh on business investment, however (Section 2). And while the fall in sterling associated with the EU referendum is boosting net trade, it is still having some dampening effects on the growth rates of household real income and consumption (Key Judgement 2). The sterling ERI was around 2½% lower than in the run-up to the *May Report* and around 17% below its late-2015 peak. As in previous *Reports*, the MPC's projections are conditioned on the average of a range of possible outcomes for the United Kingdom's eventual trading relationship with the European Union. They also assume that households and companies base their decisions on the expectation of a smooth adjustment to those new trading arrangements.

The MPC's projections, summarised in **Table 5.A**, are conditioned on those assumptions and a path for Bank Rate

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

	Projections			
	2018 Q3	2019 Q3	2020 Q3	2021 Q3
GDP ^(c)	1.5 (1.4)	1.8 (1.7)	1.7 (1.7)	1.7
CPI inflation ^(d)	2.5 (2.4)	2.2 (2.1)	2.1 (2.0)	2.0
LFS unemployment rate	4.0 (4.1)	3.9 (4.0)	3.9 (4.0)	3.9
Excess supply/Excess demand ^(e)	0 (0)	0 (0)	+¼ (0)	+½
Bank Rate ^(f)	0.6 (0.7)	0.9 (1.0)	1.0 (1.2)	1.1

(a) Modal projections for GDP, CPI inflation, LFS unemployment and excess supply/excess demand. Figures in parentheses show the corresponding projections in the *May 2018 Inflation Report*. Projections were only available to 2021 Q2 in May.

(b) The August projections have been conditioned on the assumptions that the stock of purchased gilts remains at £435 billion and the stock of purchased corporate bonds remains at £10 billion throughout the forecast period, and on the Term Funding Scheme (TFS); all three of which are financed by the issuance of central bank reserves. The May projections were conditioned on the same asset purchase and TFS assumptions.

(c) Four-quarter growth in real GDP. The growth rates reported in the table exclude the backcast for GDP. Including the backcast 2018 Q3 growth is 1.6%, 2019 Q3 growth is 1.8%, 2020 Q3 growth is 1.7% and 2021 Q3 growth is 1.7%. This compares to 1.7% in 2018 Q3, 1.7% in 2019 Q3 and 1.7% in 2020 Q3 in the *May 2018 Inflation Report*.

(d) Four-quarter inflation rate.

(e) Per cent of potential GDP. A negative figure implies output is below potential and a positive figure that it is above.

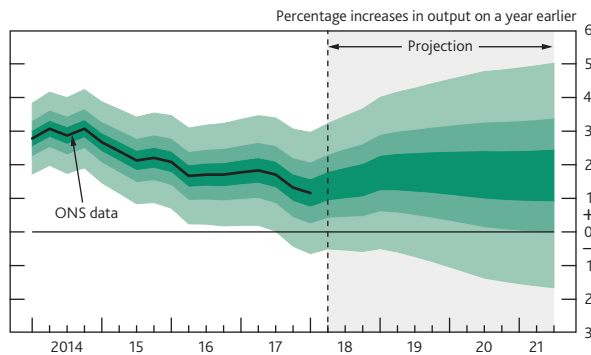
(f) Per cent. The path for Bank Rate implied by forward market interest rates. The curves are based on overnight index swap rates.

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

Per cent	2018		2019				2020				2021		
	Q3 ^(b)	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
August	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1
May	0.7	0.7	0.8	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.2	1.2

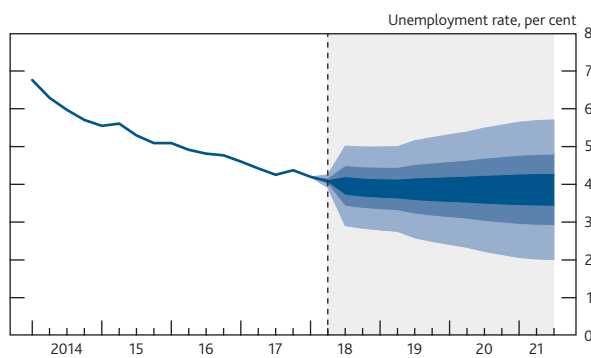
(a) The data are 15 working day averages of one-day forward rates to 25 July 2018 and 2 May 2018 respectively. The curve is based on overnight index swap rates.
 (b) August figure for 2018 Q3 is an average of realised overnight rates to 25 July 2018, and forward rates thereafter.

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



The fan chart depicts the probability of various outcomes for GDP growth. It has been conditioned on the assumptions in Table 5.A footnote (b). To the left of the vertical dashed line, the distribution reflects uncertainty around revisions to the data over the past. To aid comparability with the official data, it does not include the backcast for expected revisions, which is available at [Data from the August 2018 Inflation Report](#). To the right of the vertical line, the distribution 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 outturns 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.

Chart 5.2 Unemployment projection based on market interest rate expectations, other policy measures as announced



The fan chart depicts the probability of various outcomes for LFS unemployment. It has been conditioned on the assumptions in Table 5.A footnote (b). The coloured bands have the same interpretation as in Chart 5.1, and portray 90% of the probability distribution. The calibration of this fan chart takes account of the likely path dependency of the economy, where, for example, it is judged that shocks to unemployment in one quarter will continue to have some effect on unemployment in successive quarters. The fan begins in 2018 Q2, a quarter earlier than the fan for CPI inflation. That is because Q2 is a staff projection for the unemployment rate, based in part on data for April and May. The unemployment rate was 4.2% in the three months to May, and is projected to be 4.1% in Q2 as a whole. A significant proportion of this distribution lies below Bank staff's current estimate of the long-term equilibrium unemployment rate. There is therefore uncertainty about the precise calibration of this fan chart.

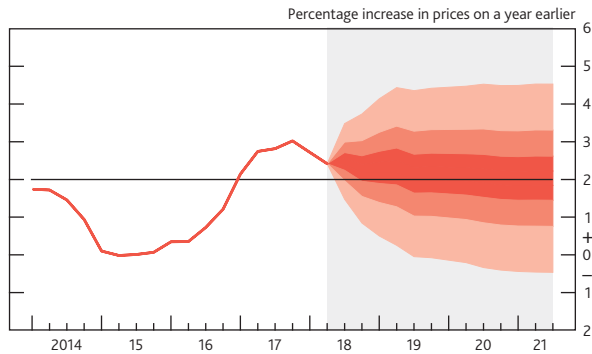
that reaches 1.1% by mid-2021 (Table 5.B), just over 10 basis points lower than in May.⁽¹⁾ Four-quarter GDP growth is projected to recover from its temporary weakness at the start of 2018, and average around 1¾% over the forecast period (Chart 5.1), similar to May. Potential supply growth is subdued relative to pre-crisis norms, reflecting continued weakness in productivity growth and slower growth of the working-age population. The pace of demand growth is more than sufficient to absorb the very limited degree of spare capacity that currently remains in the economy (Key Judgement 3). A range of indicators suggest that the labour market is tight. Unemployment remains low, and is projected to fall a little further (Chart 5.2). The economy moves into excess demand by late 2019. That leads to a continuing firming of wage growth and domestic inflationary pressures.

While domestic inflationary pressures firm over the forecast period, external cost pressures ease (Key Judgement 4). The rise in import prices following sterling's referendum-related depreciation and higher energy prices have accounted for above-target inflation since the beginning of 2017, but their combined impact is likely to subside in coming years. Inflation is projected to decline towards the target (Chart 5.3), although the depreciation of sterling since the *May Report* slows the projected pace of decline slightly compared with the previous forecast (Chart 5.4). Inflation reaches 2% in the third year of the forecast period.

At its meeting ending on 1 August 2018, the MPC voted to increase Bank Rate by 0.25 percentage points, to 0.75%, to maintain the stock of sterling non-financial investment grade corporate bond purchases, financed by the issuance of central bank reserves, at £10 billion and to maintain the stock of UK government bond purchases, financed by the issuance of central bank reserves, at £435 billion. The factors behind that decision are set out in the Monetary Policy Summary on page i of this *Report* and in more detail in the Minutes of the meeting.⁽²⁾ The remainder of this section sets out the MPC's projections and the risks around them in more detail.

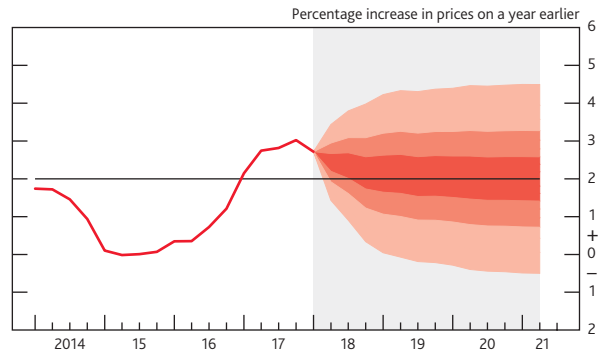
(1) Unless otherwise stated, the projections shown in this section are conditioned on: Bank Rate following a path implied by market yields; the stock of purchased gilts remaining at £435 billion and the stock of purchased corporate bonds remaining at £10 billion throughout the forecast period and the Term Funding Scheme (TFS), all three of which are financed by the issuance of central bank reserves; the Recommendations of the Financial Policy Committee and the current regulatory plans of the Prudential Regulation Authority; the Government's tax and spending plans as set out in the Spring Statement 2018; commodity prices following market paths; and the sterling exchange rate remaining broadly flat. For more details, see the 'Data from the August 2018 Inflation Report' section at www.bankofengland.co.uk/inflation-report/2018/august-2018.
 (2) The Minutes are available at www.bankofengland.co.uk/monetary-policy-summary-and-minutes/2018/august-2018.

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



Charts 5.3 and 5.4 depict the probability of various outcomes for CPI inflation in the future. They have been conditioned on the assumptions in Table 5.A footnote (b). If economic circumstances identical to today's were to prevail on 100 occasions, the MPC's best collective judgement is that inflation in any particular quarter would lie within the darkest central band on only 30 of those occasions. The fan charts are constructed so that outturns 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 5.4 CPI inflation projection in May based on market interest rate expectations, other policy measures as announced



5.1 The MPC's key judgements and risks

Key Judgement 1: global demand grows at above-potential rates

Global economic growth has remained above trend in the first half of 2018, with four-quarter growth, using PPP weights, a little under 4%. World goods trade growth has decelerated in recent months, however, and the outlook for global activity and trade appears to have moderated slightly since the *May Report*. This reflects a recent pickup in geopolitical uncertainty, in part related to an intensification of trade tensions, alongside tightening financial conditions particularly in some emerging economies. Nonetheless, financial conditions remain accommodative by historical standards and, alongside healthy business and consumer confidence, should support global growth at rates above potential over the forecast period.

Quarterly euro-area growth dipped in the first half of 2018, averaging 0.4%. That was slower than the 0.7% average rate experienced in 2017 and below the May forecast. Some of the slowing appears to reflect temporary factors, however, and indicators suggest that underlying demand growth remains healthy (Section 1). As a result, growth is expected to tick up in the near term, albeit to slightly lower rates than projected in May (Table 5.C). Thereafter, it slows towards potential. Above-trend growth will lead to the gradual absorption of spare capacity. As that slack is absorbed, core inflation is projected to rise to just over 1½% by the end of the forecast, slightly lower than expected at the time of the *May Report*.

Quarterly US growth was 1% in Q2, up from 0.5% in Q1. Q2 GDP was higher than expected in May and well above trend rates. Looking ahead, the tariffs that have been implemented and proposed on bilateral trade between the US and its trading partners, including China, are likely to weigh on growth (Section 1). Taken together, the MPC's central projection for US activity is little changed from May. As in May, growth is

Table 5.C MPC key judgements^{(a)(b)}**Key Judgement 1: global demand grows at above-potential rates**

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

Key Judgement 2: net trade and business investment continue to support UK activity, while consumption growth remains modest

	Average 1998– 2007	Projections		
		2018	2019	2020
Business investment contribution to GDP growth ^(g)	¼	¼ (¼)	¼ (¼)	½ (½)
Business investment to GDP ratio ^(h)	9¾	9½ (9½)	9¾ (9¾)	10 (10)
Net trade contribution to GDP growth ⁽ⁱ⁾	-¼	0 (¼)	¼ (¼)	¼ (¼)
Household consumption contribution to GDP growth ^(j)	2¼	¾ (¾)	¾ (¾)	¾ (¾)
Credit spreads ^(k)	¾ (l)	1½ (1½)	1½ (1½)	1½ (1½)
Household saving ratio ^(m)	8½	4½ (5½)	4½ (5½)	4½ (5½)

Key Judgement 3: demand growth outstrips subdued potential supply growth, and a margin of excess demand emerges, pushing up domestic cost growth

	Average 1998– 2007	Projections		
		2018	2019	2020
Productivity ⁽ⁿ⁾	2¼	1 (1¼)	1¼ (1¼)	1¼ (1)
Participation rate ^(o)	63	63¾ (63½)	63¾ (63½)	63¾ (63½)
Average hours ^(p)	32¼	32 (32)	32 (32)	32 (32)
Unit labour costs ^(q)	2¾	2¾ (2¾)	2¼ (2¼)	2¼ (2¼)
Unit wage costs ^(r)	2½	2½ (2¼)	2 (2¼)	2¼ (2¼)

Key Judgement 4: domestic inflationary pressures continue to build over the forecast period, while external cost pressures ease

	Average 1998– 2007	Projections		
		2018	2019	2020
UK import prices ^(s)	¼	1¾ (1¼)	¼ (-½)	0 (-½)
Dollar oil prices ^(t)	39	75 (71)	72 (65)	68 (61)

Sources: Bank of England, BDRG Continental *SME Finance Monitor*, Bloomberg Finance L.P., British Household Panel Survey, Department for Business, Energy and Industrial Strategy, Eurostat, ICE/BoAML Global Research (used with permission), 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 annual average growth rates unless otherwise stated. Figures in parentheses show the corresponding projections in the May 2018 *Inflation Report*.
- (c) Chained-volume measure. Constructed using real GDP growth rates of 180 countries weighted according to their shares in UK exports.
- (d) Chained-volume measure. Constructed using real GDP growth rates of 181 countries weighted according to their shares in world GDP using the IMF's purchasing power parity (PPP) weights.
- (e) Chained-volume measure. Forecast was finalised before the release of the preliminary flash estimate of GDP for Q2, so that is not incorporated.
- (f) Chained-volume measure.
- (g) Chained-volume measure.
- (h) Annual average. Chained-volume business investment as a percentage of GDP.
- (i) Chained-volume measure. Exports less imports.
- (j) Chained-volume measure. Includes non-profit institutions serving households.
- (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) Annual average. Percentage of total available household resources.
- (n) GDP per hour worked.
- (o) Level in Q4. Percentage of the 16+ population.
- (p) Level in Q4. Average weekly hours worked, in main job and second job.
- (q) 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.
- (r) Four-quarter growth in unit wage costs in Q4. Whole-economy total wage costs divided by GDP at market prices, based on the mode of the MPC's GDP backcast. Total wage costs are wages and salaries and the labour share multiplied by mixed income.
- (s) Four-quarter inflation rate in Q4.
- (t) Average level in Q4. Dollars per barrel. Projection based on monthly Brent futures prices.

expected to ease over the forecast, partly reflecting a declining boost from recent fiscal measures. Nevertheless, excess demand builds, and inflation is expected to remain above 2% throughout the forecast period.

While GDP growth in China and other emerging economies has in aggregate remained relatively robust, the outlook has softened compared with the *May Report*. In China, the tariffs on trade with the US, and an associated fall in equity prices, are expected to dampen growth a little. In other emerging economies, tightening monetary policy in the US and increasing trade tensions — as well as idiosyncratic institutional and political developments in some countries — have resulted in tighter financial conditions. On average, emerging economy government and corporate bond spreads have risen by around 60 basis points and equity prices have fallen by 8% since the *May Report*. Moreover, emerging economy currencies have depreciated by around 6% against the dollar, on average, and some central banks have increased policy rates to try to stem capital outflows. That tightening in financial conditions weighs on the growth projection, which is a little lower than in the *May Report*.

Global growth — based on PPP weights — is projected to be 3¾% in 2018, before slowing to 3½% (**Chart 5.5**). Weighted by UK export shares, growth is projected to slow from 2¾% in 2018 to 2¼% in 2020 (**Table 5.C**). Those projections are a little lower than three months ago, reflecting the impact of the implemented and proposed tariffs on trade and tighter financial conditions in emerging economies. The potential for a continued increase in the barriers to trade and for a further tightening in financial conditions create downside risks to the outlook. On the upside, there remains a possibility of a larger recovery in productivity growth, which would allow economies to grow more quickly without leading to inflationary pressure.

Key Judgement 2: net trade and business investment continue to support UK activity, while consumption growth remains modest

The outlook for UK demand is very similar to that in May. After some temporary weakness in the near term reflecting the slowing in quarterly growth in Q1, four-quarter GDP growth is expected to average around 1¾%. Net trade and business investment support GDP growth, while consumption grows modestly, in line with real incomes.

Net trade contributed positively to growth in 2017 and 2018 Q1. Although it is expected to have subtracted from growth in 2018 Q2 — which will depress its contribution to GDP growth in 2018 as a whole — that appears to reflect erratically weak export growth. Survey indicators of export growth remain robust (Section 2) and net trade is expected to improve in the second half of the year (**Table 5.D**). Export demand will continue to benefit from relatively robust growth

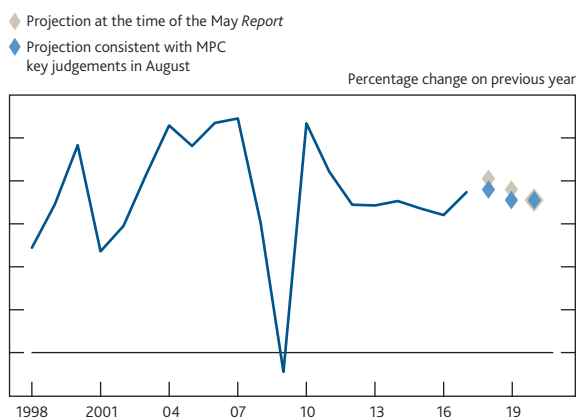
Table 5.D Monitoring risks to the Committee’s key judgements

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

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

Key judgement	Likely developments in 2018 Q3 to 2019 Q1 if judgements evolve as expected
1: global demand grows at above-potential rates	<ul style="list-style-type: none"> Quarterly euro-area GDP growth to average around ½%. Quarterly US GDP growth to average around ¾%. Indicators of activity consistent with four-quarter PPP-weighted emerging market economy growth of around 4¾%; within that, GDP growth in China to average around 6½%.
2: net trade and business investment continue to support UK activity, while consumption growth remains modest	<ul style="list-style-type: none"> After picking up in 2018 Q2, quarterly growth in business investment to average ¾%. Net trade to provide a positive contribution to quarterly GDP growth. Quarterly real post-tax household income growth to average ¼%. After picking up in 2018 Q2, quarterly consumption growth to average ¼%. Mortgage spreads to widen a little. Mortgage approvals for house purchase to average around 65,000 per month. The average of the Halifax/Markit and Nationwide house price indices to increase by around ¾% per quarter, on average. After recovering somewhat in 2018 Q2, housing investment growth to average ½%.
3: demand growth outstrips subdued potential supply growth, and a margin of excess demand emerges, pushing up domestic cost growth	<ul style="list-style-type: none"> Unemployment rate to average around 4%. Participation rate to average 63¾%. Average weekly hours worked to remain a little under 32. Quarterly hourly labour productivity growth to average around ¼%. Four-quarter growth in whole-economy AWE regular pay to average around 2¾% over the next three quarters. Four-quarter growth in whole-economy unit labour costs to average around 2¾%. Four-quarter growth in whole-economy unit wage costs to average around 2½%.
4: domestic inflationary pressures continue to build over the forecast period, while external cost pressures ease	<ul style="list-style-type: none"> Non-fuel import prices growth to rise to 2% in the year to 2019 Q1. Electricity and gas prices to be unchanged except for announced price rises. Commodity prices and sterling ERI to evolve in line with the conditioning assumptions set out in www.bankofengland.co.uk/inflation-report/2018/august-2018. Indicators of medium-term inflation expectations to continue to be broadly consistent with the 2% target.

Chart 5.5 World GDP (PPP-weighted)^(a)



Sources: IMF WEO and Bank calculations.

(a) Annual average growth rates. Chained-volume measure. Constructed using real GDP growth rates of 181 countries weighted according to their shares in world GDP using the IMF’s purchasing power parity (PPP) weights.

in the global economy. Net trade will also be supported by the lower sterling exchange rate.

Business investment has also been supported by external demand, as well as by the low cost of finance, the relatively high rate of return on capital, and the incentive to invest to expand capacity. The pace of growth has been dampened, however, by the anticipation of, and uncertainty over, Brexit. Business investment is currently estimated to have fallen in 2018 Q1. This may in part reflect the impact of adverse weather on construction-related investment (Section 2). Growth is expected to have recovered in Q2, and to remain a little above its past average rate over the rest of 2018. That rate is subdued relative to past recoveries, reflecting the drag from uncertainty. As that wanes, business investment growth is expected to rise a little further (Table 5.E), although there is a risk that uncertainty increases and weighs more heavily on growth.

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

	Average 1998– 2007	Projections		
		2018	2019	2020
Annual average growth rate				
Household consumption ^(b)	3½	1¼ (1)	1 (1¼)	1¼ (1¼)
Business investment ^(c)	2½	1¾ (2¾)	3¾ (4)	4 (4½)
Housing investment ^(d)	3¼	2½ (-¼)	1½ (½)	½ (½)
Exports ^(e)	4½	¾ (3¼)	2¼ (2¼)	1¾ (1½)
Imports ^(e)	6	½ (2)	1 (1¼)	1 (1)
Real post-tax household income ^(f)	3¼	1½ (1½)	1 (1)	1 (1¼)
Four-quarter growth rate in Q4				
Employment	1	1¼ (1)	½ (½)	½ (½)
Average weekly earnings ^(g)	4¼	2½ (2¾)	3¼ (3¼)	3½ (3½)

(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 annual average growth rates unless otherwise stated. Figures in parentheses show the corresponding projections in the May 2018 *Inflation Report*.

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

(c) Chained-volume measure.

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

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

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

(g) Whole-economy total pay.

Consumption growth has been modest since 2017. In large part, that reflects weak growth in households' real incomes, which have been squeezed by the rising cost of imports following sterling's referendum-related depreciation. Consumption growth has declined by less than real income growth over the recent past, however, as households have reduced their rate of saving, supported by rising net wealth (see Box 4), high employment and accommodative financial conditions (Section 2). Real income growth is expected to be higher over the forecast period than it has been in recent years, as nominal wage growth continues to pick up (Key Judgement 3) and the drag from import price inflation continues to fade (Key Judgement 4). Consumption is expected to grow broadly in line with real incomes, such that the saving ratio remains broadly unchanged.

The housing market has also been subdued. Price inflation has fallen over the past year and activity has been flat. That is likely in part to reflect weak real income growth, in common with consumption. Developments in the housing market can also affect consumption growth independently through wealth and collateral channels. Thus far, the weakness in the housing market appears to be concentrated in London (Section 2). The MPC judges that has partly reflected idiosyncratic factors, and so is unlikely to have significant spillovers to wider UK housing markets. Annual UK house price inflation is projected to recover to just over 3% over the forecast period.

There is uncertainty about the extent to which households will adjust their spending and saving. The saving ratio is estimated to have fallen to a low level over the past few years and households might choose to build savings at a somewhat faster rate as real income growth rises, depressing spending. Unemployment remains low, however, and households currently report a historically high degree of job security. So it is possible that households could lower their saving rate further, boosting consumption growth, with the additional support of generally healthy balance sheets.

Key Judgement 3: demand growth outstrips subdued potential supply growth, and a margin of excess demand emerges, pushing up domestic cost growth

The speed at which demand can grow before it puts upward pressure on inflation depends on the amount of slack in the economy and on the growth rate of potential supply. The MPC judges that there is currently only a very limited degree of slack remaining in the economy, given the tightness reported in the labour market (Section 3) and little evidence of much spare capacity within companies. Given that, demand can only sustainably grow at rates in line with the expansion of potential supply.

As set out in its assessment of supply-side conditions in February, the MPC judges that growth in potential supply will remain subdued relative to pre-crisis rates, at around 1½%

per year on average. Within that, labour supply growth is likely to be modest, and a little slower than current rates. That slowing in part reflects an expected decline in net inward migration in line with the ONS projections on which the MPC’s forecasts are conditioned. Offsetting that, structural productivity growth is projected to improve somewhat to close to 1%, although that remains around 1 percentage point lower than pre-crisis norms. The pickup in productivity growth over the forecast partly reflects higher investment feeding through to an increase in the capital stock.

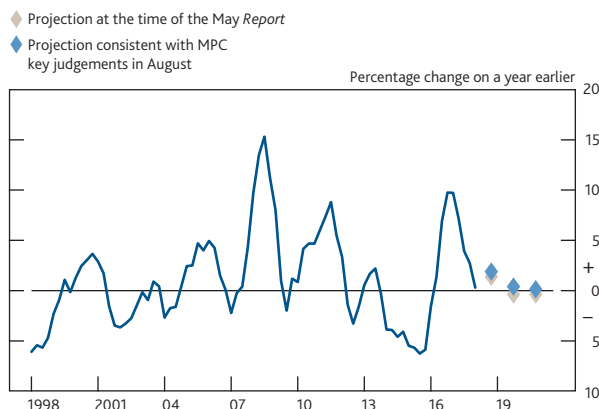
There are significant risks to the outlook for productivity. On the downside, productivity growth has been lower than expected since the financial crisis. It could fail to pick up again if, for example, lower-than-expected investment weighs on the growth of the capital stock. On the upside, productivity growth could pick up to closer to historical norms. That could be driven by a boost to productivity growth from higher investment, if companies substitute towards capital and away from labour in a tight labour market, for example.

Conditional on market interest rate expectations of Bank Rate rising to 1.1% over the forecast period, demand is projected to grow a little faster than potential supply over the forecast period, such that a small margin of excess demand emerges by late 2019 and continues to build thereafter.

The absorption of slack and emergence of excess demand will put upward pressure on domestic cost growth. Domestic inflationary pressures have been subdued over the past few years while there has been some degree of slack in the economy. Labour costs, which are the largest domestic component of companies’ costs, have generally grown at modest rates for much of the post-crisis period.

Pay growth has picked up over the past year in both the private and public sectors. The labour market has tightened and companies have found it harder to recruit and retain staff (Section 3). That is apparent in a range of survey indicators of firms’ hiring difficulties and pay — including the Agents’ recent survey (see Box 5). Higher wage growth will lead to increased inflationary pressure to the extent that it occurs without a commensurate pickup in productivity growth. Over the past year or so, the increase in annual pay growth has not been matched by higher growth in productivity per head, such that unit wage and labour cost growth have risen. Over the forecast period, private sector and whole-economy unit labour cost growth are projected to remain higher than they have been over the past few years, leading to a gradual firming in domestic inflationary pressures.

Chart 5.6 Import price inflation^(a)



Sources: ONS and Bank calculations.

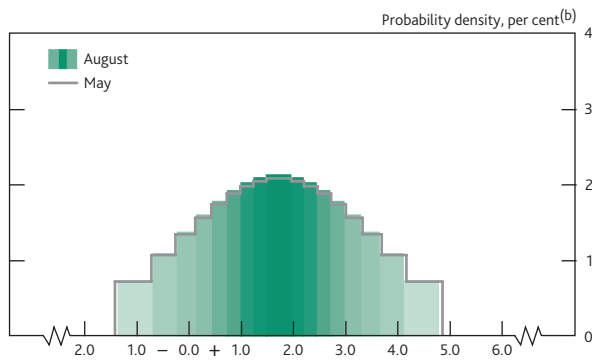
(a) Projections are four-quarter inflation rate in Q4. Excludes the impact of MTIC fraud.

Table 5.F Annual average GDP growth rates of modal, median and mean paths^(a)

	Mode	Median	Mean
2018	1.4 (1.4)	1.4 (1.4)	1.4 (1.4)
2019	1.8 (1.7)	1.8 (1.7)	1.8 (1.7)
2020	1.7 (1.7)	1.7 (1.7)	1.7 (1.7)

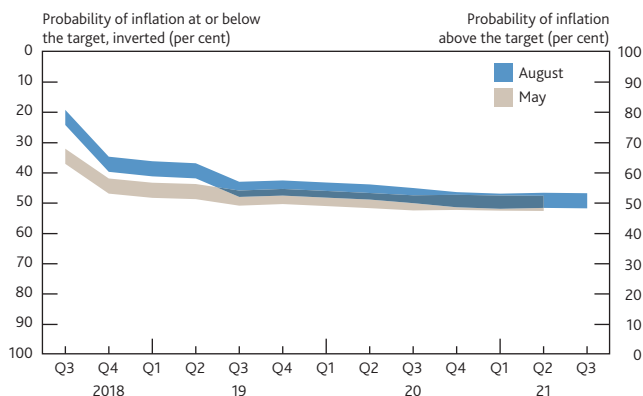
(a) The table shows the projections for annual average GDP growth rates of modal, median and mean projections for four-quarter growth of real GDP implied by the fan chart. The figures in parentheses show the corresponding projections in the May 2018 *Inflation Report* excluding the backcast. The projections have been conditioned on the assumptions in Table 5.A footnote (b).

Chart 5.7 Projected probabilities of GDP growth in 2020 Q3 (central 90% of the distribution)^(a)



(a) Chart 5.7 represents the cross-section of the GDP growth fan chart in 2020 Q3 for the market interest rate projection. The grey outline represents the corresponding cross-section of the May 2018 *Inflation Report* fan chart for the market interest rate projection excluding the backcast. The projections have been conditioned on the assumptions in Table 5.A footnote (b). The coloured bands in Chart 5.7 have a similar interpretation to those on the fan charts. Like the fan charts, they portray the central 90% of the probability distribution.
 (b) Average probability within each band; the figures on the y-axis indicate the probability of growth being within ± 0.05 percentage points of any given growth rate, specified to one decimal place.

Chart 5.8 Inflation probabilities relative to the target



The August and May swathes in this chart are derived from the same distributions as Charts 5.3 and 5.4 respectively. They indicate the assessed probability of inflation relative to the target in each quarter of the forecast period. The 5 percentage points width of the swathes reflects the fact that there is uncertainty about the precise probability in any given quarter, but they should not be interpreted as confidence intervals.

Table 5.G Q4 CPI inflation

	Mode	Median	Mean
2018 Q4	2.3 (2.2)	2.3 (2.2)	2.3 (2.2)
2019 Q4	2.2 (2.1)	2.2 (2.1)	2.2 (2.1)
2020 Q4	2.0 (2.0)	2.0 (2.0)	2.0 (2.0)

The table shows projections for Q4 four-quarter CPI inflation. The figures in parentheses show the corresponding projections in the May 2018 *Inflation Report*. The projections have been conditioned on the assumptions in Table 5.A footnote (b).

Key Judgement 4: domestic inflationary pressures continue to build over the forecast period, while external cost pressures ease

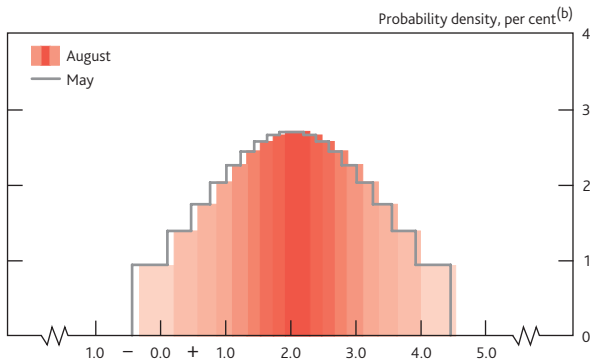
CPI inflation has fallen back since the start of 2018. In 2018 Q2 it was 2.4%, in line with the MPC’s expectation at the time of the *May Report*. The decline in inflation over 2018 has partly reflected a waning impact from import prices, which rose substantially following the referendum-related depreciation of sterling. The contribution from import prices to CPI inflation is estimated to remain elevated, however, and can account for much of the current overshoot of inflation relative to the target. The MPC judges that it is likely that the effect of sterling’s depreciation around the EU referendum on import prices has already come through, although the further pass-through to consumer prices has some way to run. Import price inflation is expected to rise again over the next few quarters, by slightly more than expected in May (Chart 5.6), reflecting the recent depreciation of sterling and an acceleration in global export prices (Section 1). It will take time for those rises to feed through fully into CPI inflation and import prices will carry on boosting inflation over the forecast period, although the overall boost will wane.

CPI inflation has also been affected by movements in energy prices. The oil price, which affects fuel prices rapidly and so can have marked temporary effects on inflation, has been volatile over the past few months. The sterling oil price rose sharply around the time of the *May Report*, pushing up petrol prices. It has fallen back a little more recently, however, which reduces its contribution to CPI inflation in the near term. Further ahead, the oil futures curve on which the MPC’s forecast is conditioned is downward sloping, such that the contribution from fuel prices to inflation turns negative.

Retail gas and electricity prices have risen over the past few months, reflecting previous increases in wholesale energy and other costs. Recent further increases in wholesale costs are likely to put upwards pressure on retail prices over the forecast period. Acting in the opposite direction is the likely impact of the forthcoming cap on households’ energy tariffs (Section 4). The MPC judges that the effects of those factors on CPI are broadly offsetting, although the size and timing of both are uncertain.

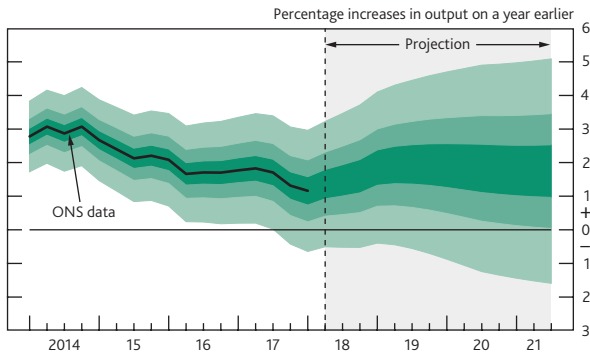
Taken together, the impact of these external factors on inflation is expected to dissipate over the forecast period. The projected strengthening in domestic inflationary pressures as excess demand builds (Key Judgement 3) only partially offsets that dissipation in external cost pressures, such that in the central projection CPI inflation declines towards the 2% target. Inflation is judged likely to be a little above the target over much of the forecast period,

Chart 5.9 Projected probabilities of CPI inflation in 2020 Q3 (central 90% of the distribution)^(a)



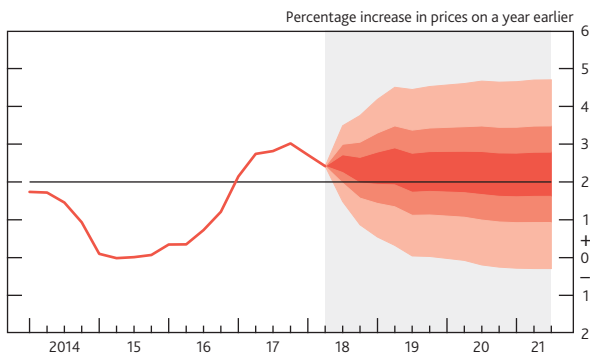
(a) Chart 5.9 represents the cross-section of the CPI inflation fan chart in 2020 Q3 for the market interest rate projection. The grey outline represents the corresponding cross-section of the May 2018 Inflation Report fan chart for the market interest rate projection. The projections have been conditioned on the assumptions in Table 5.A footnote (b). The coloured bands in Chart 5.9 have a similar interpretation to those on the fan charts. Like the fan charts, they portray the central 90% of the probability distribution.
 (b) Average probability within each band; the figures on the y-axis indicate the probability of inflation being within ± 0.05 percentage points of any given inflation rate, specified to one decimal place.

Chart 5.10 GDP projection based on constant nominal interest rates at 0.75%, other policy measures as announced



See footnote to Chart 5.1.

Chart 5.11 CPI inflation projection based on constant nominal interest rates at 0.75%, other policy measures as announced



See footnote to Chart 5.3

before returning to 2% in the third year. That is slightly higher than expected in May, mainly reflecting the impact of the recent depreciation of sterling.

5.2 The projections for demand, unemployment and inflation

Based on these judgements, under the market path for Bank Rate and the assumption of an unchanged stock of purchased assets, the MPC projects four-quarter GDP growth to average around 1¾% over the forecast period (Table 5.F). That projection is similar to the May forecast (Chart 5.7). Within demand, consumption growth is projected to remain modest relative to historical rates, with net trade and investment supporting growth, in turn supported by relatively robust global growth. The risks around the projection are balanced, as in May.

The economy’s supply capacity is judged likely to grow at a subdued pace — of around 1½% per year on average — over the forecast period. That is slightly lower than demand growth, with unemployment projected to fall a little further as a result and the economy moving into excess demand by late 2019.

CPI inflation has fallen back since the beginning of 2018, but remains above the MPC’s 2% target. The inflation overshoot reflects the impact of external cost pressures from import and energy prices. Inflation is projected to fall further towards the target as those effects wane, more than offsetting building domestic inflationary pressures. Under the market path for Bank Rate, inflation is judged likely to decline towards the target, reaching 2% in the third year of the forecast period (Chart 5.8). The projection is higher than in May (Table 5.G), mainly reflecting the effect of the recent depreciation of sterling. The risks around the inflation projection remain balanced (Chart 5.9).

Charts 5.10 and 5.11 show the MPC’s projections under the alternative constant rate assumption and an unchanged stock of purchased assets. That assumption is that Bank Rate remains at 0.75% throughout the three years of the forecast period, before rising towards the market path over the subsequent three years. Under that path, GDP growth is stronger, and a greater degree of excess demand emerges, with unemployment falling towards 3½%. Inflation is higher and ends the forecast period above the target at 2.2%.

Box 6

The equilibrium interest rate

The MPC sets monetary policy to meet the 2% inflation target, and in a way that helps to sustain growth and employment. The policy rate required to achieve these objectives will vary over time. Prior to the financial crisis, the level of Bank Rate set by the Committee averaged 5%.⁽¹⁾ During the crisis, however, Bank Rate needed to be cut sharply in order for the MPC to meet its objectives in the face of major headwinds to demand. While Bank Rate is expected to need to rise gradually as those headwinds diminish and slack is absorbed, longer-term structural influences mean that those rises are expected to be limited and it is unlikely that Bank Rate will return to pre-crisis levels anytime soon. This box presents the MPC’s latest assessment of those influences on Bank Rate and the outlook for coming years.

Understanding the equilibrium interest rate

The ‘equilibrium interest rate’ is the interest rate that, if the economy starts from a position with no output gap and inflation at the target, would sustain output at potential and inflation at the target. Setting Bank Rate equal to the equilibrium interest rate may not be sufficient to meet the 2% inflation target at all times, however. For example, if output were below (above) its potential, Bank Rate would need to be set below (above) the equilibrium rate for a period of time in order to return output to potential. Furthermore, some shocks may create a trade-off between the speed at which inflation is returned to the target and the support provided to jobs and activity.⁽²⁾

The equilibrium interest rate cannot be directly observed, and so is not used by monetary policy makers as a direct guide to setting policy. But to the extent that it — and the factors driving it — can be estimated, it may help to explain the evolution of interest rates over the past and provide an indication of the outlook for interest rates over coming years.

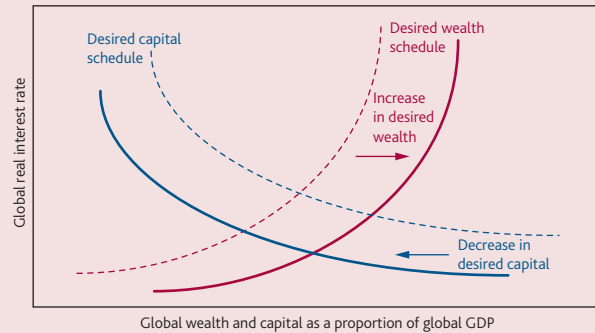
One framework for understanding the equilibrium real interest rate (r^*) — the equilibrium interest rate adjusted for inflation — decomposes it into a longer-run, or ‘trend’, component (R^*) and a shorter-term component (s^*):

$$\underbrace{r^*}_{\text{Equilibrium real rate}} = \underbrace{R^*}_{\text{Trend real rate}} + \underbrace{s^*}_{\text{Shorter-term component}}$$

The trend real rate, R^* , is determined by slow-moving structural factors that affect the balance between the demand for capital and the stock of wealth available to finance it. For an open economy like the UK, those factors will reflect global influences as well as domestic ones. The upward-sloping red lines in **Figure A** show that the quantity of wealth individuals

want to hold tends to increase as real interest rates rise, since a higher real interest rate implies a greater return on saving. In contrast, the demand for capital (shown in the blue lines) tends to be downward sloping: as the quantity of capital rises, its marginal product falls and so each extra unit of wealth will earn a lower return.

Figure A In the long run, real interest rates are determined by the balance between desired wealth and capital holdings
Stylised diagram of shifts in desired wealth and capital schedules



The trend real rate has fallen over the past few decades across advanced economies. Much of that fall can be explained by structural factors such as an ageing global population, which — for a given real interest rate — have raised the quantity of wealth individuals wish to hold (a rightward shift in the red line in **Figure A**). Other structural factors, including a decline in trend productivity growth, have reduced businesses’ demand for capital (a leftward shift in the blue line). Combined, these developments have reduced the trend real interest rate required to bring actual stocks of wealth and capital into line.

Over the nearer term, the equilibrium real interest rate, r^* , can fluctuate around its trend level as a result of shorter-term influences on the economy, s^* . During the financial crisis, a number of headwinds to demand — including a rise in uncertainty and a tightening in the financial conditions facing households and firms — meant that the equilibrium real rate fell sharply. These headwinds to demand are taking many years to dissipate, meaning that the equilibrium real rate remains well below the trend real rate R^* , which is itself well below its longer-term average.

The outlook for both the trend real rate and these shorter-term headwinds will have implications for the likely future path of Bank Rate. To the extent that the structural shifts in desired wealth and demand for capital persist, Bank Rate is likely to remain materially below the 5% level set

(1) Indeed, over the entire period since the Bank of England was founded in 1694, Bank Rate has averaged close to 5%.
(2) For more details, see Carney, M (2017), ‘[Lambda](#)’ and Carney, M (2018), ‘[Guidance, contingencies and Brexit](#)’.

Table 1 There is a wide range of existing estimates of r^* and R^* Existing estimates and projections of the equilibrium real interest rate^(a)

Region	Source	Horizon of estimate	Central estimate (per cent)	Range (per cent)
United Kingdom	Term structure models (Bank staff) ^(b)	2028	½	[-0.5,1.75]
	Holston, K, Laubach, T and Williams, J (2017) ^(c)	'Longer run'	1½	[-2.75,5.75]
United States	Eggertsson, G, Mehrotra, N and Robbins, J (2017)	2018	-2½	
	Christensen, J and Rudebusch, G (2017)	2022–27	0	
	Laubach, T and Williams, J (2015) ^(d)	'Longer run'	0	[-5.5,5.5] ^(e)
	Holston, K, Laubach, T and Williams, J (2017) ^(d)	'Longer run'	½	[-2.5,3.75] ^(e)
	Kiley, M (2015) ^(d)	'Longer run'	½	[-0.5,1.5] ^(e)
	Johannsen, B K and Mertens, E (2016) ^(d)	'Trend'	¾	[-1.25,2.5] ^(e)
	Gagnon, E, Johannsen, B K and Lopez-Salido, D (2016)	2030	¼	
	Lubik, T and Matthes, C (2015) ^(d)	2023	1	[-2.25,4.5] ^(e)
	Del Negro, M, Giannone, D, Giannoni, M and Tambalotti, A (2017) ^(d)	2038	1¼	[0.75,2] ^(e)
	Lewis, K and Vazquez-Grande, F (2017) ^(d)	'Longer run'	1¾	[0.5,3] ^(e)
World	Hamilton, J, Harris, E, Hatzius, J and West, K (2016)	2018	½	[-0.5,1.5] ^(f)
	Rachel, L and Smith, T (2017)	2020–30	1	
	Lisack, N, Sajedi, R and Thwaites, G (2017)	2030–50	1½	

(a) All estimates and ranges are reported to the nearest 25 basis points.

(b) Range based on four different term structure models. The central estimate is the average of the results from these models. See the box on pages 6–7 of the May 2017 Report for more details.

(c) Range based on ± 1 standard error. Figures based on the authors' latest available estimates.

(d) As reported in the Federal Reserve July 2018 Monetary Policy Report.

(e) 95% confidence interval.

(f) 90% confidence interval.

on average by the Committee prior to the crisis. Over the shorter term, however, Bank Rate is likely to need to rise gradually as the headwinds to demand recede and the current margin of spare capacity is absorbed (Section 5).

Estimating the trend real interest rate, R^*

The trend real interest rate, R^* , cannot be directly observed and is difficult to estimate with precision. There are a number of ways in which it can be estimated. One approach is to use market-based measures implied by long-term government bond yields. As explained in the box on pages 6–7 of the *May 2017 Report*, 'term structure' models can be used to decompose these yields into expected future short-term interest rates and term premia, which are the additional compensation that investors require for holding longer-maturity assets. The average of a range of measures of the short-term interest rate component currently implies a forecast for R^* of around ½% in 10 years' time (Table 1).

Macroeconomic models can also be used to estimate how R^* has evolved over the past. Table 1 presents estimates from a range of studies for different regions based on a variety of such models. These estimates span a wide range of values, in part reflecting the fact that they are likely to capture some aspects of s^* as well as R^* , as well as substantial variation in modelling techniques. There are few existing estimates of R^* for the UK, although the openness of the UK economy means that the level of R^* in the UK is likely to be highly correlated with the level in other advanced economies.

Bank staff have developed a new approach to estimating R^* for the UK.⁽³⁾ An advantage of this approach, compared to others, is that it takes account of the fact that some determinants may overlap and so reduces the possibility that these will be double counted. One drawback, however, is that a number of simplifying assumptions are needed in order to capture these determinants within a tractable framework, and some potential determinants are not easy to model in this way. Uncertainty around the central estimates due to these assumptions, as well as the potential impacts of some omitted determinants, are discussed below.

The estimation approach follows two stages:

- First, a **statistical filter** is used to estimate R^* over the past. Over long enough periods of time, shorter-term movements in real interest rates should average zero. The filter removes these fluctuations, leaving an estimate of R^* which will reflect slow-moving structural factors. The filter cannot be used over more recent periods, however, as it relies on data over both earlier and subsequent years to provide an estimate for any given year.

(3) One rationale for producing these estimates was that existing work has tended to focus either on global or US trend real interest rates. In addition, existing estimates for the UK — for example Holston, K, Laubach, T and Williams, J (2017), 'Measuring the natural rate of interest: international trends and determinants' — have not investigated the drivers, or potential future path, of the trend real interest rate.

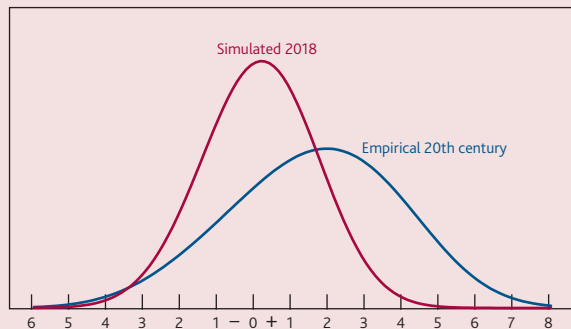
- Second, an **overlapping generations model** is used to estimate the change in R^* since 1990 and to produce a projection.⁽⁴⁾ In this model, R^* is the rate at which the wealth accumulated by households is sufficient to finance the capital demanded by firms. Given the openness of the UK economy to global capital flows, global changes in desired wealth and capital are likely to be important in determining the trend real rate in the UK. The model used by Bank staff allows UK R^* to depend on both global and domestic structural developments.

Results based on this approach suggest that R^* in the UK has fallen by more than 2 percentage points since 1990. Allowing for uncertainty around the precise starting point and filter length, R^* in real terms is estimated to have fallen from around 2¼%–3¼% (with a modal estimate of around 2½%) to around 0%–1% currently (with a modal estimate of around ¼%).⁽⁵⁾ Adding the 2% inflation target in order to convert those numbers into nominal terms results in a current estimate of nominal R^* in the range of 2%–3%.⁽⁶⁾ As explained in more detail below, shorter-term forces currently acting on the UK economy have pushed nominal r^* below this level.

There is substantial additional uncertainty around these estimates, however, depending on the modelling assumptions and the paths for the main determinants of R^* in the model. One calibration of those uncertainties is shown in **Chart A**. The red line shows the estimated probability attached to the current level of R^* having a particular value, while the blue line shows the historical distribution of real interest rates over the 20th century. The leftward shift from the blue line to the red line implies that there has been a material fall in the level of R^* over time. But the range of potential values of current R^* covered by the red line shows that plausible changes in assumptions can translate into substantial differences in its estimated level.

Chart A There is a wide degree of uncertainty around the estimated level of R^*

Estimated distribution of the trend real rate^(a)



(a) The blue line shows a smoothed distribution of the low-frequency component of actual UK real interest rates. The red line shows a smoothed distribution of the UK trend real rate generated by Bank staff's model under the range of possible values of R^* in 1990 (discussed in footnote (5)), alternative assumptions for the model parameters, and the paths of the main determinants.

Many of the factors estimated to have lowered R^* over the past are likely to persist for many years, such that R^* is projected to remain around its current level for some time to come. There is a wide degree of uncertainty around the persistence of the fall, however. Factors that are omitted from the model estimates may also play a role, and are discussed below.

Influences on R^*

Part of the estimated decline in R^* can be explained by an increase in the amount of wealth individuals wish to hold for a given real rate of interest. In turn, much of that increase has been due to the effects of changing global demographics (**Table 2**). Net wealth typically rises over an individual's working life, since people tend to accumulate savings gradually in order to finance spending in their retirement. Over the past few decades, global population growth has slowed as birth rates have declined and life expectancy has increased. Together, these developments have contributed towards a rising average age of the population of advanced economies (**Chart B**),⁽⁷⁾ which has meant that a greater proportion of the population is at stages of life associated with higher levels of wealth. The corresponding rise in wealth holdings is estimated to have reduced R^* since 1990.

Table 2 Changing demographics and a fall in trend productivity growth have reduced R^*

Indicative contributions to changes in the trend real interest rate^(a)

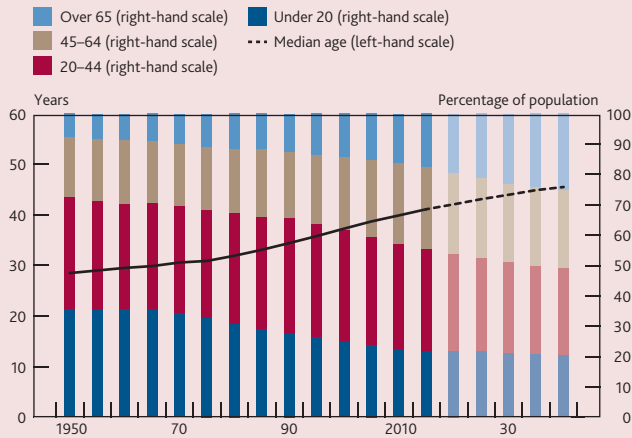
	Change since 1990
Structural factors affecting desired wealth	
Slower population growth	↓ ↓
Increased life expectancy	↓ ↓
Increased old-age employment	↑
Increased government debt	↑
Structural factors affecting the demand for capital	
Slower productivity growth	↓ ↓
Increased cost of financial intermediation	↓
Total	↓

(a) The direction of the arrows indicates the direction of the impact of each factor on R^* since 1990, estimated using the approach outlined above. Two arrows indicate that a factor has had a relatively large impact on R^* .

(4) For more details on such models, see for example Lisack, N, Sajedi, R and Thwaites, G (2017), 'Demographic trends and the real interest rate'. Demographic shifts are important determinants of R^* , and one benefit of this modelling approach is that it allows different generations of individuals to be modelled separately and to interact with each other.
 (5) The 1990 range represents the 5th and 95th percentiles of estimates based on slightly different starting years and a distribution around the time period to which the statistical filter is applied. The range around the 2018 estimate represents the impact of using those different estimates for the starting value in 1990. Given the additional uncertainty around the estimate for 2018, the equivalent interval shown in **Chart A** is wider.
 (6) A more accurate calculation of the trend rate in nominal terms would involve adding a measure of CPI inflation expectations rather than the 2% inflation target. Note that index-linked gilts are indexed to RPI inflation.
 (7) For more details see Lisack, N, Sajedi, R and Thwaites, G (2017), *ibid*.

Chart B The average age of the population is projected to rise further

Age distribution of the population in advanced economies^(a)



Source: United Nations (UN) World Population Prospects.

(a) Countries included are classified as 'more developed regions'. Dashed line and faded bars are UN median variant projections.

The slowing in global population growth and rise in life expectancy are projected to continue, which will continue to weigh on R^* relative to the past. The median UN projection implies that the average age of the population in advanced economies will rise from 41 years in 2015 to 45 years over the subsequent two and a half decades (Chart B).

The extent to which the rising average age of the global population reduces R^* will depend on the degree to which older people adjust their working patterns. As explained in the box on pages 30–31 of the November 2014 *Inflation Report*, the proportion of older people in work has risen steadily in recent decades across advanced economies. That will have limited the number of years in retirement that individuals are likely to face, and consequently the amount of wealth required in order to finance their retirement spending. Rising old-age employment is estimated to have pushed up slightly on R^* , relative to the past, partly offsetting the downward pressure from slower population growth and rising life expectancy (Table 2). In the event that future policy changes result in further rises in the average retirement age, that could also provide support to R^* in the future.

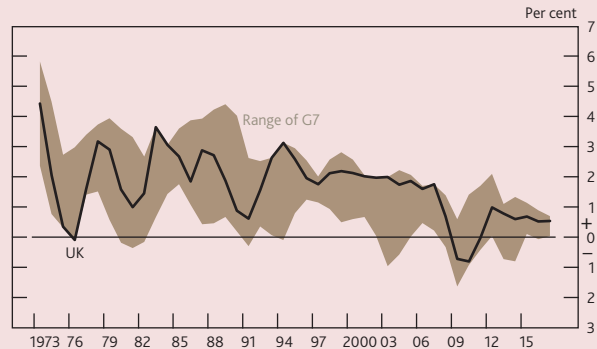
Another factor estimated to have pushed up slightly on R^* is a rise in the stock of government debt relative to GDP across advanced economies in recent decades (Table 2), which, for a given real interest rate, has reduced the quantity of wealth available to finance investment in the capital stock. To the extent that these higher levels of debt persist, that will continue to support R^* in the future.⁽⁸⁾

Part of the estimated decline in R^* can also be explained by a fall in the demand for capital for a given real rate of interest. One reason for that fall has been a slowing in the growth rate

of productivity (Chart C), and hence the potential returns on new investment. To the extent that productivity growth picks up, R^* will increase in coming years, all else equal.

Chart C Productivity growth in advanced economies has slowed

Productivity growth in the G7 economies^(a)



Sources: OECD, ONS and Bank calculations.

(a) Rolling three-year averages for annual growth in output per worker in Canada, France, Germany, Italy, Japan, the UK and US.

Another factor estimated to have reduced the demand for capital — and hence R^* — is a rise in the cost of financial intermediation (Table 2). Part of that rise has reflected heightened perceptions of risk following the financial crisis (see below). The rise has also reflected reforms implemented since the crisis to increase the resilience of the financial system and to end the problem of 'too big to fail'. For example, as part of a broader set of measures, UK banks are now required to hold far greater loss-absorbing resources and their capital requirements have increased tenfold. By raising the cost of financing, these reforms are likely to require R^* to be lower than in the past for a given level of demand for capital from businesses.

Desired wealth and the demand for capital may be affected by other factors that are not included within the central estimates:

- (i) Changes in risk perceptions and risk attitudes may have reduced R^* over the past. That could have stemmed from an increase in the perceived risk of large falls in output (tail risk).⁽⁹⁾ Greater risk aversion may have contributed to the build-up of savings by Asian economies following the crises of the 1990s and early 2000s, as they looked to

(8) Under strong assumptions, the level of government debt has no effect on real interest rates. This 'Ricardian equivalence' result relies on households and firms recognising that higher government debt will ultimately be paid for by increased future taxes. In more general settings, such as the model used by Bank staff, some households and firms may not be liable for higher future taxes (for example, because they may die), and so government debt holdings represent net wealth to those households and firms.

(9) For more details, see Kozłowski, J., Veldkamp, L and Venkateswaran, V (2018), 'The tail that keeps the riskless rate low', and Vlieghe, G (2017), 'Real interest rates and risk'.

self-insure against the possibility of similar events in future. More recently, the global financial crisis may have encouraged banks, companies and households to hold a larger proportion of their portfolio in safe assets.⁽¹⁰⁾

- (ii) Acting in the opposite direction, the increasing financial integration of lower-income countries may push up R^* in coming years. One reason for that is that the population of lower-income countries is younger on average than that of advanced economies. In addition, increased financial integration could boost R^* by supporting a pickup in overall global productivity growth. While rising productivity within lower-income economies in recent decades has closed some of the productivity gap with advanced economies, there remains significant scope for further catch-up.
- (iii) An increase in automation could also affect R^* . On the one hand, further automation could raise the productivity of the capital stock, which could in turn raise businesses' demand for capital. On the other hand, to the extent that automation results in a lower share of income accruing to lower-skilled employees, that could raise income and wealth inequality. Since wealthier households tend to save a larger proportion of their incomes on average, that could weigh on R^* relative to the past.

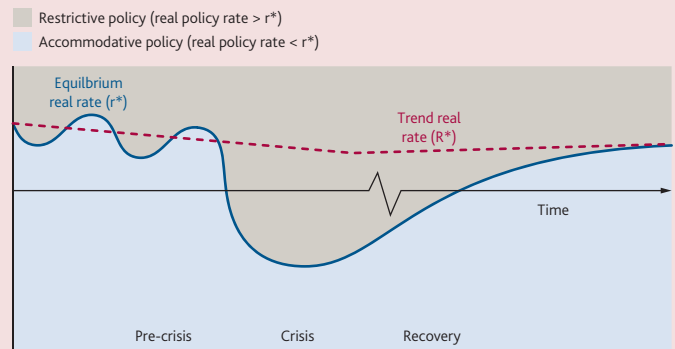
The equilibrium real interest rate over the shorter term, r^*

Over the shorter term, the equilibrium real interest rate, r^* , can fluctuate around its trend level, R^* , as a result of shorter-term influences on the economy. A temporary fall in desired spending relative to potential output, for example, would be likely to reduce the level of r^* required to maintain output at its potential and to keep inflation around the target.

r^* is very difficult to estimate with precision. **Figure B** presents a stylised illustration of how it has probably been evolving relative to its trend, R^* .

During the financial crisis, spending fell sharply in the UK as uncertainty rose, growth in other advanced economies slowed, and increased risk aversion and heightened perceptions of risk on the part of investors resulted in a tightening in financial conditions. Both the public and private sectors sought to reduce their pace of borrowing. These shorter-term factors pushed r^* down sharply and it became negative (**Figure B**).⁽¹¹⁾ In such circumstances, setting the effective real policy rate below r^* helps support the economy and close the output gap. Following the crisis, the MPC supported demand by cutting Bank Rate to 0.5% and purchasing assets to provide further monetary stimulus.

Figure B r^* fell sharply during the financial crisis
Stylised diagram of the equilibrium real interest rate



Many of the headwinds to spending — including the need for balance sheet repair following the financial crisis — have persisted for some time. Nevertheless, it is likely that r^* has risen gradually in recent years, with easier financial conditions, a reduced fiscal drag, the end of private sector deleveraging in the UK and, in the last couple of years, stronger global growth.

The outlook for interest rates

The outlook for the equilibrium real interest rate in coming years depends on the persistence of the fall in the trend real rate, R^* , as well as the extent to which the shorter-term factors (s^*) currently pushing down the equilibrium real rate, r^* , continue to unwind.

While any rise in trend productivity growth over coming years could raise R^* somewhat, many of the structural factors currently weighing on R^* — in particular, changes in demographics — are likely to persist for many years to come. That means that over the longer term, R^* , and hence r^* , are likely to remain lower than in the past.

In the near term, however, the MPC judges that, while recent headwinds to demand have meant that r^* has remained below R^* , r^* is likely to rise gradually towards R^* if uncertainty dissipates and as the fiscal consolidation imparts less of a drag on growth than on average in recent years.

The expected rise in r^* over coming years, combined with the absorption of spare capacity over the forecast period (Section 5), means that — even as inflation is projected to fall back towards 2% — Bank Rate is likely to need to rise gradually in order to keep inflation at the target. But the persistence of the fall in the trend real rate means that any rises in Bank Rate are expected to be limited, and interest rates are likely to need to remain low by historical standards for some time to come.

(10) For more details, see Bernanke, B (2005), 'The global saving glut and the US current account deficit' and Caballero, R, Farhi, E and Gourinchas, P-O (2017), 'The safe assets shortage conundrum'.

(11) Various studies support the idea that the equilibrium real interest rate became negative during the financial crisis, both in the UK and other advanced economies. See for example Del Negro, M, Giannoni, M, Cocci, M, Shahanaghi, S and Smith, M (2015), 'Why are interest rates so low?'.

Box 7 Other forecasters' expectations

This box reports the results of the Bank's most recent survey of external forecasters, carried out in July.⁽¹⁾ On average, respondents had expected four-quarter GDP growth to pick up gradually to 1.7% in three years' time (Table 1). That was unchanged relative to expectations three months ago. External forecasters' central projections for the unemployment rate had declined (Chart A), although they remained higher, on average, than the equivalent *Inflation Report* forecast (Section 5), and implied a rise in unemployment over the next three years.

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

	2019 Q3	2020 Q3	2021 Q3
CPI inflation ^(b)	2.0	2.0	2.0
GDP growth ^(c)	1.5	1.6	1.7
LFS unemployment rate	4.3	4.4	4.5
Bank Rate (per cent)	1.0	1.4	1.7
Stock of purchased gilts (£ billions) ^(d)	435	430	413
Stock of purchased corporate bonds (£ billions) ^(d)	10	10	10
Sterling ERI	78.6	78.5	78.9

Source: Projections of outside forecasters as of 18 July 2018.

(a) For 2019 Q3, there were 22 forecasts for CPI inflation, 22 for GDP growth, 19 for the unemployment rate, 21 for Bank Rate, 16 for the stock of gilt purchases, 13 for the stock of corporate bond purchases and 10 for the sterling ERI. For 2020 Q3, there were 18 forecasts for CPI inflation, 18 for GDP growth, 16 for the unemployment rate, 18 for Bank Rate, 14 for the stock of gilt purchases, 12 for the stock of corporate bond purchases and 9 for the sterling ERI. For 2021 Q3, there were 15 forecasts for CPI inflation, 16 for GDP growth, 14 for the unemployment rate, 16 for Bank Rate, 11 for the stock of gilt purchases, 10 for the stock of corporate bond purchases and 8 for the sterling ERI.

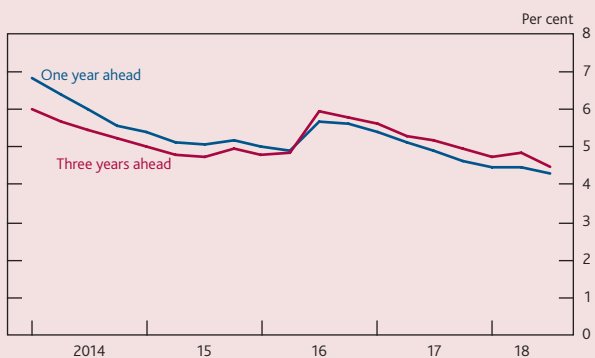
(b) Twelve-month rate.

(c) Four-quarter percentage change.

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

Chart A External forecasters' unemployment projections had fallen

Averages of forecasters' central projections of the unemployment rate

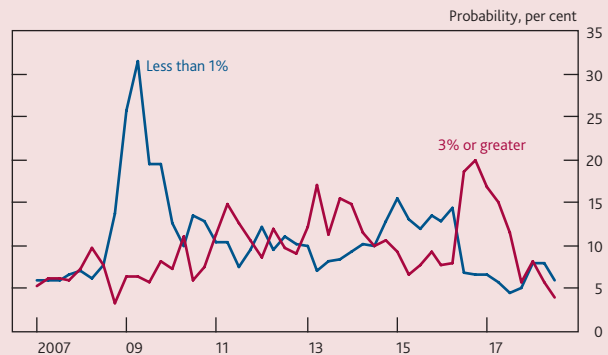


Sources: Projections of outside forecasters provided for *Inflation Reports* between February 2014 and August 2018.

External forecasters, on average, had expected CPI inflation to be at the 2% target at all horizons. And the average probability placed on inflation being more than 1 percentage point away from the target in two years' time — either below 1% or at least 3% — had fallen to around historically low levels (Chart B).

Chart B The average probability attached to CPI inflation being more than 1 percentage point away from the target in two years' time had fallen

Averages of forecasters' probabilities attached to CPI inflation outcomes in two years' time

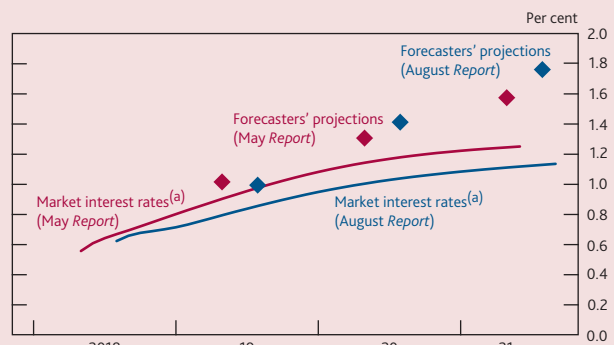


Sources: Projections of outside forecasters provided for *Inflation Reports* between February 2007 and August 2018.

External forecasters' central expectations for Bank Rate at the two and three-year horizons had increased, on average, relative to three months ago. And those average central projections were higher than the market-implied path for interest rates (Chart C). As in May, almost all forecasters expected the current stock of gilt and corporate bond purchases to remain unchanged over the next two years, although the former was expected to have fallen a little by the three-year horizon.

Chart C Expectations of Bank Rate were higher than implied by financial market prices

Market interest rates and averages of forecasters' central projections of Bank Rate



Sources: Bloomberg Finance L.P., projections of outside forecasters provided for *Inflation Reports* in May 2018 and August 2018 and Bank calculations.

(a) Estimated using instantaneous forward overnight index swap rates in the 15 working days to 2 May 2018 and 25 July 2018 respectively.

(1) For detailed distributions, see '[Other forecasters' expectations](#)'.

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.
LFS – Labour Force Survey.
PMI – purchasing managers' index.
PPI – producer price index.
RPI – retail prices index.
RPI inflation – inflation measured by the retail prices index.
ULC – unit labour cost.

Abbreviations

BCC – British Chambers of Commerce.
BRC – British Retail Consortium.
CBI – Confederation of British Industry.
CEIC – CEIC Data Company Ltd.
CFO – chief financial officer.
CIPD – Chartered Institute of Personnel and Development.
CIPS – Chartered Institute of Purchasing and Supply.
DSR – debt-servicing ratio.
EC – European Commission.
ECB – European Central Bank.
EME – emerging market economy.
EU – European Union.
FOMC – Federal Open Market Committee.
FTSE – Financial Times Stock Exchange.
GfK – Gesellschaft für Konsumforschung, Great Britain Ltd.
GVA – gross value added.
ICE/BoAML – Intercontinental Exchange/Bank of America Merrill Lynch.
IMF – International Monetary Fund.
ISA – individual savings account.
LTV – loan to value.
MIDAS – mixed-data sampling.

MFI – monetary financial institution.
MPC – Monetary Policy Committee.
MSCI – Morgan Stanley Capital International Inc.
MTIC – missing trader intra-community.
NHS – National Health Service.
NPISH – non-profit institutions serving households.
NS&I – National Savings and Investments.
OBR – Office for Budget Responsibility.
OECD – Organisation for Economic Co-operation and Development.
Ofgem – Office of Gas and Electricity Markets.
ONS – Office for National Statistics.
PNFC – private non-financial corporation.
PPP – purchasing power parity.
PwC – PricewaterhouseCoopers.
REC – Recruitment and Employment Confederation.
RICS – Royal Institution of Chartered Surveyors.
S&P – Standard & Poor's.
SMEs – small and medium-sized enterprises.
SVT – standard variable tariff.
TFS – Term Funding Scheme.
VAT – Value Added Tax.
WEO – IMF *World Economic Outlook*.

Symbols and conventions

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

n.a. = not available.

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

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