

Inflation Report

May 2019



BANK OF ENGLAND





BANK OF ENGLAND

Inflation Report

May 2019

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

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

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

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

The Monetary Policy Committee:

Mark Carney, Governor

Ben Broadbent, Deputy Governor responsible for monetary policy

Jon Cunliffe, Deputy Governor responsible for financial stability

Dave Ramsden, Deputy Governor responsible for markets and banking

Andrew Haldane

Jonathan Haskel

Michael Saunders

Silvana Tenreyro

Gertjan Vlieghe



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/2019/may-2019

Contents

Monetary Policy Summary	i
<hr/>	
1 Global developments and domestic financial conditions	1
<hr/>	
1.1 Global economic developments	1
1.2 Domestic financial conditions	2
Box 1 Monetary policy since the February <i>Report</i>	5
Box 2 Recent developments in new mortgage rates	6
2 Demand and output	7
<hr/>	
2.1 Near-term outlook	7
2.2 Demand and the impact of Brexit-related uncertainties	8
Box 3 Stockbuilding and its implications for the near-term growth outlook	11
Box 4 The housing market and its impact on GDP	12
Box 5 Agents' update on business conditions	14
3 Supply and spare capacity	16
<hr/>	
3.1 Labour market: developments and prospects	16
3.2 The outlook for potential supply	18
4 Costs and prices	20
<hr/>	
4.1 Consumer price developments and the near-term outlook	20
4.2 Energy and import prices	21
4.3 Domestic cost pressures	22
4.4 Inflation expectations	23
5 Prospects for inflation	25
<hr/>	
5.1 The MPC's key judgements and risks	28
5.2 The projections for demand, unemployment and inflation	33
Box 6 How has the economy evolved relative to the February 2018 <i>Report</i> ?	34
Box 7 Other forecasters' expectations	38
<hr/>	
Glossary and other information	39

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 May 2019, the MPC voted unanimously to maintain Bank Rate at 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.

The Committee's updated projections for activity and inflation are set out in the accompanying May *Inflation Report*. They assume a smooth adjustment to the average of a range of possible outcomes for the United Kingdom's eventual trading relationship with the European Union. They are also conditioned on a path for Bank Rate that rises to around 1% by the end of the forecast period, lower than in the February *Report*. As with UK financial conditions more generally, that path has been heavily influenced by recent global developments, with forward interest rates in the United States and the euro area falling markedly.

The MPC has noted previously that UK data could be unusually volatile in the near term, due to shifting expectations about Brexit in financial markets and among households and businesses. GDP is expected to have grown by 0.5% in 2019 Q1, in part reflecting a larger-than-expected boost from companies in the United Kingdom and the European Union building stocks ahead of recent Brexit deadlines. That boost is expected to be temporary, however, and quarterly growth is expected to slow to around 0.2% in Q2. Smoothing through those developments, the underlying pace of GDP growth appears to be slightly stronger than previously anticipated, but marginally below potential. That subdued pace reflects the impact of the slowdown in global growth and ongoing Brexit uncertainties. The latter is having a particularly pronounced impact on business investment, which has been falling for a year. The MPC judges that there is currently a small margin of excess supply in the economy.

In the MPC's central projection, global growth stabilises around its potential rate and Brexit uncertainties subside gradually. Four-quarter UK GDP growth begins to pick up next year and rises to over 2% by the end of the forecast period. Business investment recovers and household spending continues to support demand growth, sustained by rising real incomes. GDP growth picks up above the subdued pace of potential supply growth, such that excess demand begins to build. Excess demand rises above 1% of potential output by the end of the forecast period, notably higher than in the February *Report*, reflecting the support to demand provided by lower market interest rates and easier financial conditions more generally.

CPI inflation was 1.9% in March and is expected to be slightly further below the MPC's 2% target during the first half of the forecast period, largely reflecting lower expected retail energy prices. The labour market remains tight, with the unemployment rate projected to decline to 3½% by the end of the forecast period. Annual pay growth has remained around 3½% and unit labour cost growth has strengthened to rates that are above historical averages. As excess demand emerges, domestic inflationary pressures are expected to firm, such that CPI inflation picks up to above the 2% target in two years' time and is still rising at the end of the three-year forecast period.

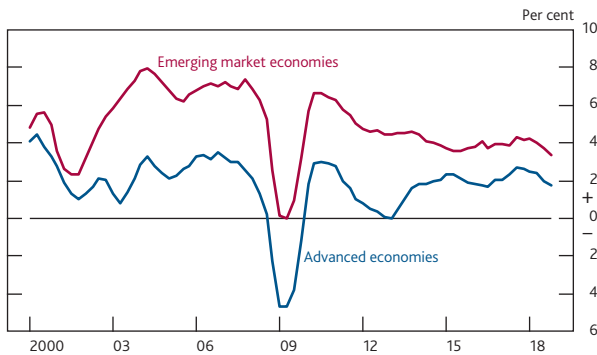
The Committee continues to judge that, were the economy to develop broadly in line with its *Inflation Report* projections, an ongoing tightening of monetary policy over the forecast period, at a gradual pace and to a limited extent, would be appropriate to return inflation sustainably to the 2% target at a conventional horizon. The MPC judges at this meeting that the current stance of monetary policy is appropriate.

The economic outlook will continue to depend significantly on the nature and timing of EU withdrawal, in particular: the new trading arrangements between the European Union and the United Kingdom; whether the transition to them is abrupt or smooth; and how households, businesses and financial markets respond. The appropriate path of monetary policy will depend on the balance of these effects on demand, supply and the exchange rate. The monetary policy response to Brexit, whatever form it takes, will not be automatic and could be in either direction. The Committee will always act to achieve the 2% inflation target.

1 Global developments and domestic financial conditions

- Global growth slowed over 2018, but appears to have stabilised in recent months. There has been a shift in the policy outlook in major economies and an associated easing in global financial conditions, which is expected to support global growth.
- In the UK, the market path for interest rates is lower as in other advanced economies, while sterling has appreciated a little.

Chart 1.1 The slowdown in global growth has been broad-based
Four-quarter UK-weighted GDP growth^(a)



Sources: Eikon from Refinitiv, IMF *World Economic Outlook (WEO)* and Bank calculations.
(a) Constructed using data for real GDP growth rates for 180 countries weighted according to their shares in UK exports.

1.1 Global economic developments

There was a broad-based slowing in global GDP growth over 2018 across advanced and emerging market economies (Chart 1.1). UK-weighted world GDP growth appears to have stabilised in 2019 Q1, with quarterly growth expected to have increased to 0.6% (Table 1.A), higher than projected at the time of the February Report. US GDP growth picked up to 0.8% in 2019 Q1, euro-area growth rose to 0.4%, while growth in China was 1.4%.

The slowdown in global growth in part reflects a tightening in financial conditions during 2017–18, as asset prices adjusted to tighter policy, especially in the US and China. It may also reflect the imposition of trade barriers, such as tariffs on trade between the US and China, which may have contributed to weaker business confidence and a slowdown in world trade growth (Chart 1.2). In advanced economies, the slowdown in growth has been concentrated in investment and net trade (Chart 1.3).

Higher-frequency indicators suggest that UK-weighted global GDP growth will be around 0.5% in 2019 Q2. Global manufacturing and export order PMIs stabilised in 2019 Q1, having fallen over 2018, for example.

Against the backdrop of weak data, there has been a shift in the policy outlook in some major economies, with monetary policy in particular now expected to be looser than previously expected (Chart 1.4).

In the euro area, the European Central Bank (ECB) announced that policy rates are expected to remain at present levels at least until the end of 2019, longer than stated in its guidance at the time of the February Report. To help support bank lending conditions and the smooth transmission of monetary policy, the ECB also announced further two-year targeted longer-term refinancing operations, to be offered from 2019 Q3 to 2021 Q1. The market path for policy rates in the euro area slopes upwards, but gently.

Table 1.A Global GDP growth appears to have stabilised in 2019 Q1

GDP in selected countries and regions^(a)

Percentage changes on a quarter earlier

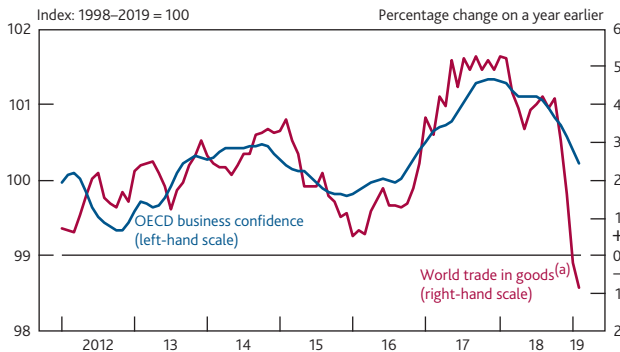
	Quarterly averages								
	1998–2007	2012–13	2014–15	2016	2017	2018 H1	2018 Q3	2018 Q4	2019 Q1
United Kingdom	0.7	0.5	0.7	0.4	0.4	0.2	0.7	0.2	n.a.
Euro area (39%)	0.6	0.0	0.4	0.5	0.7	0.4	0.1	0.2	0.4
United States (18%)	0.7	0.5	0.6	0.5	0.6	0.8	0.8	0.5	0.8
China (4%) ^(b)	2.5	1.9	1.7	1.7	1.6	1.6	1.6	1.5	1.4
Japan (2%)	0.3	0.4	0.1	0.3	0.6	0.2	-0.6	0.5	n.a.
India (1%)	1.8	1.6	1.7	1.9	1.9	1.7	1.3	1.7	n.a.
Russia (1%) ^(c)	1.9	0.5	-0.4	0.3	0.3	0.7	0.7	0.8	n.a.
Brazil (1%)	0.8	0.6	-0.7	-0.6	0.6	0.2	0.5	0.1	n.a.
UK-weighted world GDP ^(d)	0.7	0.4	0.6	0.6	0.7	0.6	0.4	0.4	0.6

Sources: Eikon from Refinitiv, IMF *WEO*, National Bureau of Statistics of China, OECD, ONS and Bank calculations.

(a) Real GDP measures. Figures in parentheses are shares in UK exports in 2017.
(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) As defined in footnote (a) of Chart 1.1. Figure for 2019 Q1 is a Bank staff projection.

Chart 1.2 Growth of world trade in goods has slowed sharply and business confidence has fallen

OECD business confidence and world trade in goods

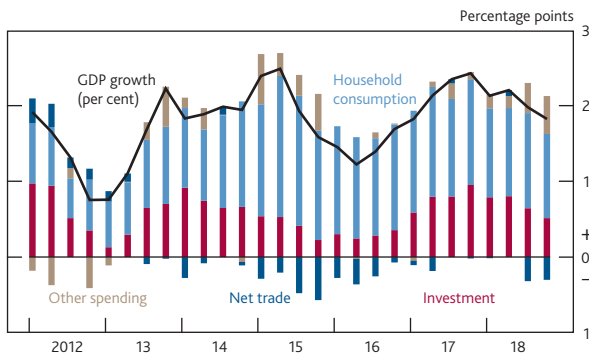


Sources: CPB Netherlands Bureau for Economic Policy Analysis, OECD and Bank calculations.

(a) Three-month moving average. Volume measure.

Chart 1.3 The slowdown in advanced-economy growth has been concentrated in investment and net trade

Contributions to four-quarter GDP growth in the G7 economies^(a)

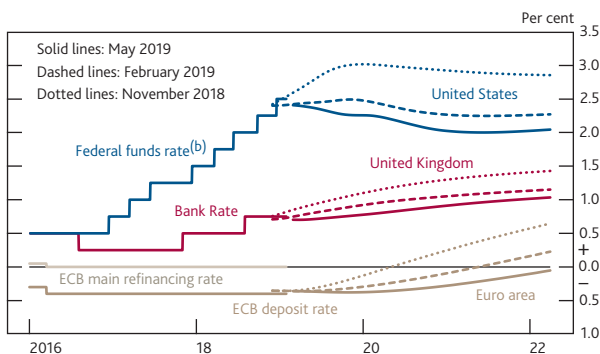


Sources: Eikon by Refinitiv, IMF WEO, OECD and Bank calculations.

(a) Growth in real purchasing power parity (PPP)-weighted GDP.

Chart 1.4 Market-implied paths for interest rates have fallen markedly

International forward interest rates^(a)



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

(a) The May and February 2019 and November 2018 curves are estimated using instantaneous forward overnight index swap rates in the 15 working days to 24 April 2019, 30 January 2019 and 24 October 2018 respectively.

(b) Upper bound of the target range.

In the US, the Federal Open Market Committee made no changes to its target range for the federal funds rate in March. But the path of policy rates implied by market prices has declined further over the past three months and is markedly lower than in November. It is now downward sloping, suggesting that market participants view a cut in the policy rate as more likely than an increase in coming years. The Committee also announced an end to the reduction in its balance sheet by September 2019.

In China, the authorities announced further fiscal measures to support activity, including significant cuts in taxes and increases in infrastructure expenditure. The latest fiscal measures, alongside a previous easing in monetary and credit policies, should provide support to demand.

Lower expectations for the path of policy rates have contributed to a rise in global risky asset prices, reversing weakness at the end of 2018. Equity prices internationally have risen since February (Chart 1.5) — the S&P 500 had its strongest quarter for almost 10 years for example — and corporate bond spreads have narrowed further (Chart 1.6). As a result, global financial conditions have loosened since February.

Financial market-based measures of investor uncertainty, such as the VIX measure of implied equity price volatility, have fallen back to below historical averages. Other measures of uncertainty paint a different picture, however. The Baker, Bloom and Davis index of global policy uncertainty, which includes media references to uncertainty and other indicators such as the dispersion of professional forecasts, remains elevated (Chart 1.7).

In the MPC’s central projection, the easing in global financial conditions, as well as previously announced tariff increases on US-China trade not being implemented, are expected to provide support to global growth. Four-quarter UK-weighted GDP growth is expected to trough in Q2 before recovering somewhat in 2019 H2 and settling around trend rates. The projection is a little higher than at the time of the February Report.

1.2 Domestic financial conditions

As in other countries, UK short and longer-term interest rates have fallen and equity prices have risen since February. Credit conditions facing corporates have loosened a little as corporate bond spreads have narrowed, while those facing households have remained generally favourable. Sterling has appreciated a little.

Market interest rates and sterling

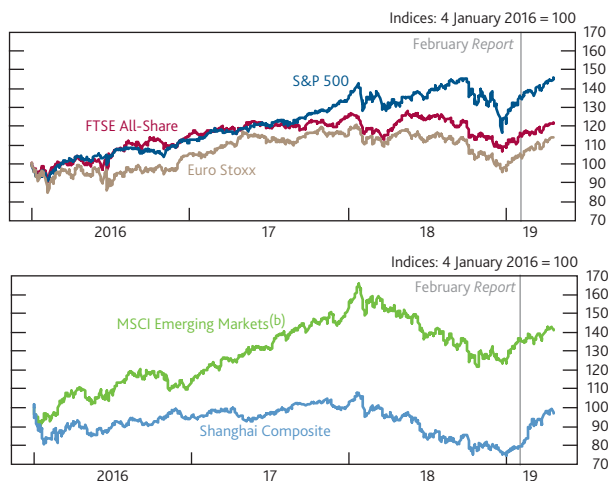
The market-implied path of Bank Rate over the next three years is, on average, around 15 basis points lower than in

Table 1.B Monitoring the MPC's key judgements

Developments anticipated in February during 2019 Q1–2019 Q3	Developments now anticipated during 2019 Q2–2019 Q4
Advanced economies	Revised up slightly
<ul style="list-style-type: none"> Quarterly euro-area GDP growth to average ¼%. Quarterly US GDP growth to average ½%. 	<ul style="list-style-type: none"> Quarterly euro-area GDP growth to average a little above ¼%. Quarterly US GDP growth to average ½%.
Rest of the world	Broadly unchanged
<ul style="list-style-type: none"> Indicators of activity consistent with four-quarter PPP-weighted emerging market economy growth of around 4¼%; within that, GDP growth in China to average around 6%. 	<ul style="list-style-type: none"> Indicators of activity consistent with four-quarter PPP-weighted emerging market economy growth of around 4¼%; within that, GDP growth in China to average around 6%.
The exchange rate and commodity prices	Revised up
<ul style="list-style-type: none"> Commodity prices and the sterling ERI to evolve in line with the conditioning assumptions set out in this Report. 	<ul style="list-style-type: none"> US dollar oil prices are 18% higher. The sterling ERI is 1.5% higher. Commodity prices and the sterling ERI to evolve in line with the conditioning assumptions set out in this Report.
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 1.5 Equity prices have risen since February

Equity prices in advanced economies and emerging markets^(a)

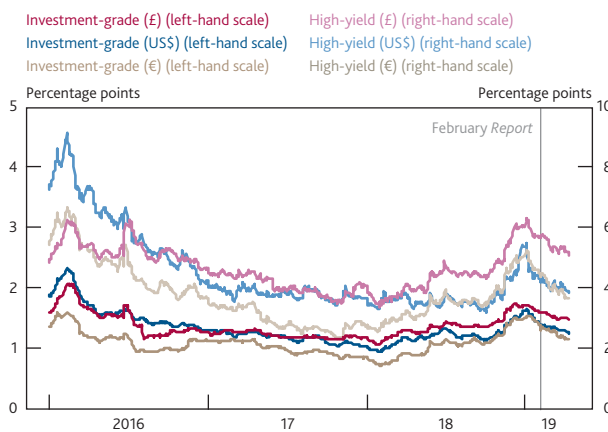


Sources: Eikon from Refinitiv, MSCI and Bank calculations.

(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](#).

Chart 1.6 Corporate bond spreads have narrowed

International non-financial corporate bond spreads^(a)



Sources: Eikon from Refinitiv, ICE/BoAML Global Research 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.

February, and is now expected to reach around 1.0% in three years' time (Chart 1.4). Longer-term UK interest rates are also lower: the yield on 10-year UK government bonds has declined to 1.2% from 1.3%. Combined with the moves in the run-up to the February Report, both short and long-term interest rates have fallen by around 40 basis points since November.

The sterling ERI has been sensitive to Brexit developments. It has appreciated by 1½% since the February Report, which market contacts attribute to a lower probability being attached to a no-deal Brexit. The sterling ERI remains around 15% below its November 2015 peak (Chart 1.8).

Following the extension to the negotiation period for the UK's withdrawal from the EU, sterling implied volatilities — an indicator of uncertainty around the outlook for the exchange rate — fell sharply. And the cost of insuring against a large depreciation relative to a large appreciation also fell, as market participants appear to be pricing in a lower probability of a sharp fall in sterling over the next six months.

Credit conditions facing companies and households

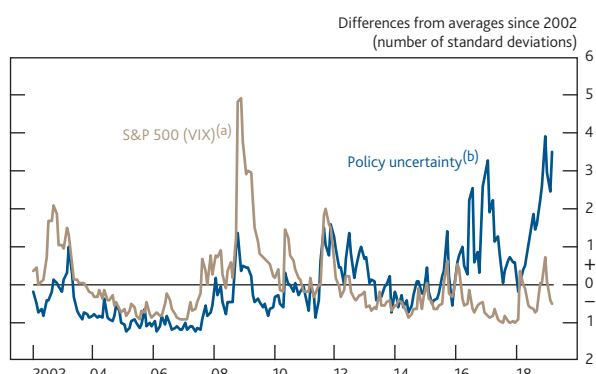
Over the past few years, credit conditions facing companies have been relatively accommodative. However, conditions in corporate bond markets — which large companies use to borrow — deteriorated at the end of 2018. Bond spreads across the main markets in which UK companies borrow widened markedly (Chart 1.6). These spreads have since narrowed, driven by the same factors that eased financial conditions globally (Section 1.1). UK corporate bond issuance has resumed, although it remained below its historical average in 2019 Q1 with most issuance concentrated among investment-grade companies.

According to the Credit Conditions Survey, the availability of bank credit to companies has been little changed in recent quarters. However, reports from the Bank's Agents suggest that the availability of credit has tightened for sectors that may be more exposed to Brexit, such as export-focused firms.

The Credit Conditions Survey indicates that the demand for corporate credit has remained subdued. Respondents to the Survey did, however, report an increase in the demand for inventory finance in Q1 and almost two thirds of respondents to the Lloyds Business Barometer survey in March reported that they were prepared for Brexit-related pressures on working capital. Supervisory intelligence suggests that, as yet, the banks accounting for the majority of lending to corporates have not reduced their willingness to provide working capital finance. The majority of respondents to the Agents' recent survey also reported no change in the availability and cost of working capital or trade finance in the past three months (Box 5).

Chart 1.7 Global policy uncertainty remains elevated

Global policy uncertainty and implied volatility of US equity prices



Sources: Bloomberg Finance L.P., policyuncertainty.com and Bank calculations.

- (a) VIX measure of 30-day implied volatility of the S&P 500 equity index. Monthly averages.
 (b) See Baker, S R, Bloom, N and Davis, S J (2016), 'Measuring economic policy uncertainty', *The Quarterly Journal of Economics*.

Credit conditions facing households have generally remained favourable. Mortgage rates have been stable at low levels, despite large moves in spreads on banks' unsecured wholesale debt over the past six months. Box 2 discusses recent developments in mortgage rates.

There is some evidence of a tightening in household credit conditions in parts of the unsecured lending market. While personal loan rates remain low (Table 1.C), respondents to the *Credit Conditions Survey* reported that the availability of unsecured credit tightened further in 2019 Q1. In the credit card market, interest-free periods on purchases and balance transfers have continued to fall; the maximum 0% balance transfer period has fallen to below 30 months for the first time since 2013. That tightening in credit supply is likely to have accounted for some of the slowing in consumer credit growth over 2018.

Chart 1.8 Sterling has risen a little since February

Sterling ERI

**Table 1.C Retail interest rates remain low**Selected household quoted rates^(a)

	April 2019 (per cent)	Change since (basis points)			
		January 2019	July 2018	August 2017	January 2017
Mortgages					
Two-year variable rate, 75% LTV	1.60	-2	6	21	11
Two-year fixed rate, 60% LTV	1.60	-5	-13	36	27
Two-year fixed rate, 75% LTV	1.67	-5	-8	24	22
Five-year fixed rate, 75% LTV	2.03	-2	-1	7	-19
Two-year fixed rate, 90% LTV	2.19	-4	-11	-14	-31
Two-year fixed rate, 95% LTV	2.96	-8	-82	-106	-66
Consumer credit					
£10,000 personal loan	3.79	6	3	0	10
Credit card	19.87	120	152	191	191
Deposits					
Instant access	0.42	15	21	28	27
Cash ISA	0.93	7	25	58	53
One-year fixed-rate bond	0.95	-12	8	9	35
One-year fixed-rate ISA	1.34	-7	0	23	45
Two-year fixed-rate bond	1.04	-20	-28	-12	19
Two-year fixed-rate ISA	1.29	-11	6	19	47

(a) The Bank's quoted rate series are weighted monthly average rates advertised by all UK banks and building societies with products meeting the specific criteria. Not seasonally adjusted. Data for April are flash estimates and subject to change until they are published on 8 May. Since February 2019 data, the methodology used to calculate these data has changed; for more information see www.bankofengland.co.uk/statistics/articles/2019/introduction-of-new-quoted-rates-data.

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

At its meeting ending on 21 March 2019, the MPC noted that the news in economic data had been mixed, but that the February *Report* projections appeared on track. In those projections, a weaker near-term outlook was expected to lead to a small margin of slack opening up this year. Thereafter, demand growth exceeded the subdued pace of supply growth and excess demand built over the second half of the forecast period.

The broad-based softening in global GDP and trade growth had continued. Global financial conditions had eased, in part supported by announcements of more accommodative policies in some major economies.

Shifting expectations about the potential nature and timing of the UK's withdrawal from the EU had continued to generate volatility in UK asset prices, particularly the sterling exchange rate. Brexit uncertainties had also continued to weigh on confidence and short-term economic activity, notably business investment. Employment growth had been strong, although survey indicators suggested that the outlook had softened. Most indicators of consumer spending were consistent with ongoing modest growth. As the Committee had previously noted, short-term economic data might provide less of a signal than usual about the medium-term growth outlook.

CPI inflation had risen slightly to 1.9% in February and was expected to remain close to the 2% target over coming months. The labour market had remained tight and annual pay growth, having risen through 2018, had remained around 3½%. Given continuing weakness in productivity growth, growth in unit wage costs had also risen, although other indicators of domestically generated inflation had remained modest.

The Committee's February *Report* projections were conditioned on a smooth adjustment to the average of a range of possible outcomes for the UK's eventual trading relationship with the EU. The MPC noted that the economic outlook would continue to depend significantly on the nature and timing of EU withdrawal, in particular: the new trading arrangements between the EU and the United Kingdom; whether the transition to them is abrupt or smooth; and how households, businesses and financial markets respond. The appropriate path of monetary policy would depend on the balance of these effects on demand, supply and the exchange rate. The monetary policy response to Brexit, whatever form it takes, would not be automatic and could be in either direction.

As in February, the MPC judged that the current stance of monetary policy remained appropriate. The Committee continued to judge that, were the economy to develop broadly in line with its February *Report* projections, an ongoing tightening of monetary policy over the forecast period, at a gradual pace and to a limited extent, would be appropriate to return inflation sustainably to the 2% target at a conventional horizon.

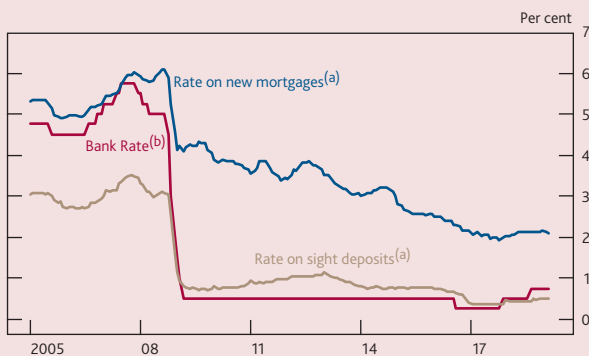
Box 2

Recent developments in new mortgage rates

Over the period since the financial crisis, the average interest rate on new mortgages has fallen markedly reaching a low of just under 2% in October 2017. Since then, Bank Rate has risen by 50 basis points but the average rate on new mortgages has increased by less (Chart A). As a result, the difference between new mortgage rates and risk-free rates — the mortgage spread — has fallen further.

Chart A The average interest rate on new mortgages has risen by less than Bank Rate recently

Bank Rate and household effective interest rates



(a) The Bank's effective rate series are weighted averages of rates from a sample of banks and building societies with products meeting the specific criteria. Not seasonally adjusted.
(b) End-month rate.

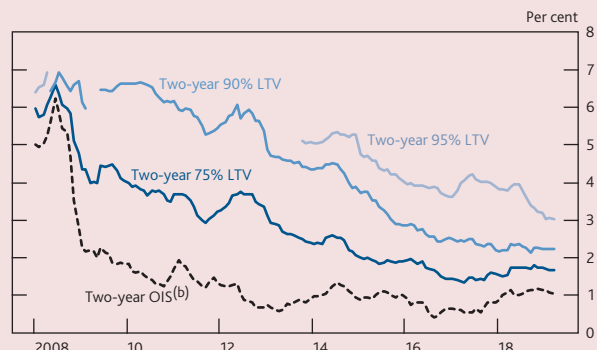
One factor that is likely to have weighed on new mortgage rates, potentially offsetting the upward impetus from Bank Rate, is competition in the mortgage market. Discussions with lenders suggest that competition has been intense for some time. Since the start of 2018 this is most apparent in the high loan to value (LTV) segment of the mortgage market: the average quoted rate on two-year fixed 95% LTV mortgages has fallen by around 80 basis points despite reference rates having picked up slightly (Chart B).

Competition in the mortgage market may have been amplified by the ring-fencing of major UK banks which separates retail banking services from other activities.⁽¹⁾ As some ring-fenced entities have more domestic deposits than loans, and are subject to restrictions on the type of banking activity they can undertake, they may be incentivised to increase mortgage lending.

Lending rates will also be affected by developments in banks' funding costs. While the cost of bank funding raised in wholesale markets has fluctuated substantially in recent months, those movements have not been transmitted to mortgage rates. As discussed in Box 1 of the *February Report*, the importance of wholesale unsecured funding spreads in loan pricing is likely to have fallen as the large retail banks increased their share of deposit funding, particularly sight

Chart B High LTV mortgage rates have fallen recently, despite reference rates having picked up

Average quoted rates on two-year mortgages and two-year OIS rate^(a)



(a) The Bank's quoted rate series are weighted monthly average rates advertised by all UK banks and building societies with products meeting the specific criteria. Not seasonally adjusted.
(b) Monthly averages of two year ahead sterling overnight index swap (OIS) rates.

deposits, relative to wholesale funding. Indeed, the value of banks' deposits now exceeds that of their loans, and supervisory intelligence indicates that banks take into account deposit rates when pricing loans.

Given those developments, the stability of deposit rates over the past few years (Chart A) may help explain the stability of mortgage rates. Prior to 2008, sight deposit rates were some way below Bank Rate. When Bank Rate was cut to very low levels during the financial crisis, deposit rates fell by less and the spread between them became positive. Retail banks' desire to return this spread towards more normal levels may help explain why deposit rates, and therefore mortgage rates, have not risen one-for-one with Bank Rate recently.⁽²⁾

In the MPC's projection, mortgage rates are expected to pick up gradually over the forecast period partly because spreads on new mortgage lending over risk-free rates widen a little. There is uncertainty around that judgement, however, as it will depend on how factors such as competitive pressures and deposit rates evolve. The MPC will continue to monitor the dynamics in the mortgage market, as well as its implications for the monetary transmission mechanism more broadly.

(1) For more information see Britton, K, Dawkes, L, Debbage, S and Idris, T (2016), 'Ring-fencing: what is it and how will it affect banks and their customers?', *Bank of England Quarterly Bulletin*, 2016 Q4.

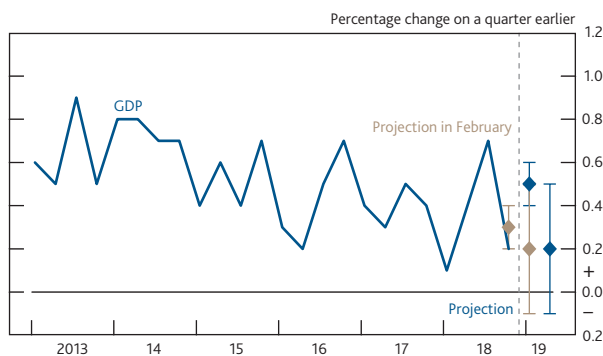
(2) See Saunders, M (2019), 'Pass-through of Bank Rate to household interest rates'.

2 Demand and output

- GDP growth appears to have been stronger than expected in Q1, but is expected to be subdued in the near term.
- Brexit-related uncertainty has led to a reduction in business investment and an increase in stockbuilding. In comparison, household spending has been relatively resilient, although the housing market has remained subdued.
- A weaker global economy has dragged on export growth.

Chart 2.1 GDP growth is expected to be stronger than projected in 2019 Q1

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

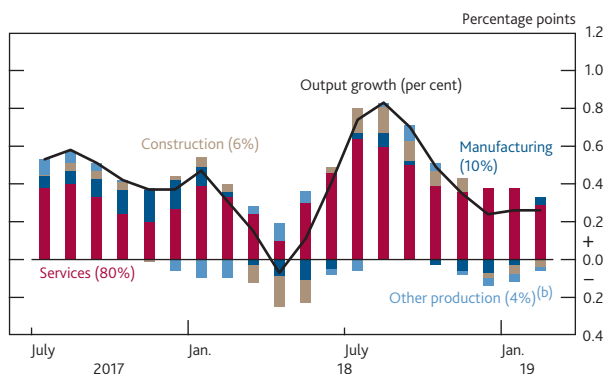


Sources: ONS and Bank calculations.

(a) Chained-volume measure. GDP is at market prices. The blue diamonds show Bank staff's projection for the first estimate of GDP growth in 2019 Q1 and Q2. 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 2019 Q1 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 2019 Q1 rises to 0.2 percentage points. For 2019 Q2, the RMSE of 0.3 percentage points is based on the full evaluation window.

Chart 2.2 Manufacturing output picked up in early 2019

Contributions to three-month on three-month output growth by sector^(a)



(a) Chained-volume measures at basic prices. Figures in parentheses are weights in nominal GVA in 2016. Contributions may not sum to the total due to rounding.
(b) Other production includes utilities, extraction and agriculture.

2.1 Near-term outlook

Based on ONS data to February, quarterly GDP growth is expected to have picked up to 0.5% in 2019 Q1, from 0.2% in 2018 Q4, stronger than projected in the *February Report* (Chart 2.1). Part of this pickup was driven by a recovery in manufacturing output (Chart 2.2), and may reflect a boost from companies building up stocks ahead of a potential no-deal Brexit. It is also possible that stockbuilding has boosted output in some parts of the services sector (Box 3). Growth in Q1 also appears to have been lifted by erratic monthly movements in output: GDP fell by 0.3% in December before rising by 0.5% and 0.2% in January and February respectively.

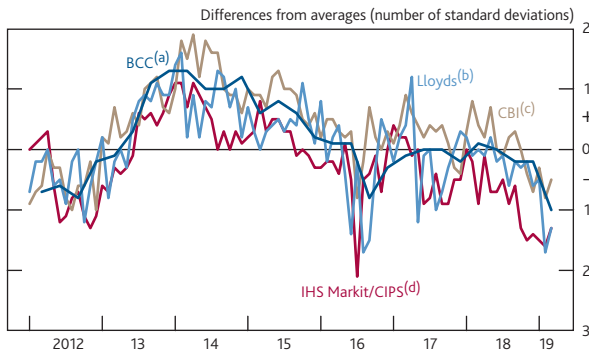
Business surveys have weakened markedly since the start of the year (Chart 2.3), and point to weaker growth in 2019 Q1 than the official data. As discussed in Box 3 of the *February Report*, the relationship between survey responses and GDP growth may be weaker at times of high uncertainty. This may be, in part, because surveys are sensitive to changes in sentiment. But there are also reasons to be cautious in interpreting the official GDP data, which can move sharply from quarter to quarter and are often revised over time.

Uncertainty around near-term projections is larger than normal at present and growth outturns could be volatile. In the MPC's central projection, the boost from stockbuilding is expected to be temporary, and quarterly growth is expected to slow to 0.2% in 2019 Q2. Smoothing through recent developments, the underlying pace of GDP growth appears to have been slightly stronger than anticipated in February, but nonetheless marginally below potential. GDP growth is expected to remain a little below potential rates in the second half of 2019.

On the expenditure side, the balance of growth is expected to remain broadly unchanged in 2019 (Table 2.A). As in 2018,

Chart 2.3 Survey indicators of expected output growth are well below their historical averages

Survey indicators of expected output growth



Sources: BCC, CBI, IHS Markit, Lloyds Banking Group and Bank calculations.

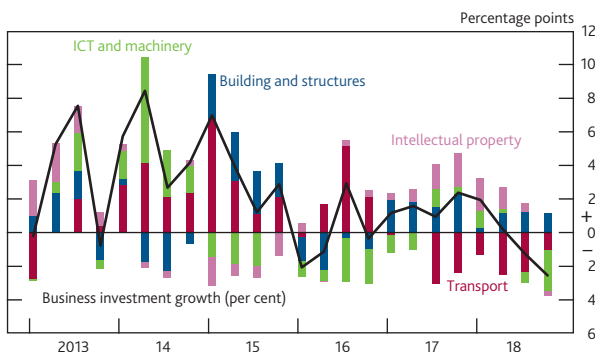
- (a) Net percentage balance of respondents in the non-services and services sectors reporting they expect turnover to increase over the next year, weighted together using output shares. Data are not seasonally adjusted. Differences from average since January 2000.
- (b) Net percentage balance of respondents with turnover over £1 million that expect business activity to increase over the next year. Differences from average since January 2002.
- (c) Net percentage balance of respondents from the manufacturing, distribution, consumer, business and professional services sectors reporting that they expect output to increase in the next three months weighted together using output shares. Differences from average since October 2003.
- (d) Net percentage balance of respondents expecting business activity to rise over the next year (service and construction) or reporting that new orders have increased over the month (manufacturing), weighted together using output shares. Differences from averages since January 2000.

Table 2.A Monitoring the MPC’s key judgements

Developments anticipated in February during 2019 Q1–2019 Q3	Developments now anticipated during 2019 Q2–2019 Q4
Consumer spending	Revised up slightly
<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 just over ¼%. • Quarterly consumption growth to be between ¼% and ½%.
Housing market	Revised down
<ul style="list-style-type: none"> • Mortgage approvals for house purchase to average around 65,000 per month. • The UK house price index to increase by around ¼% per quarter, on average. • Housing investment to fall by ½% per quarter, on average. 	<ul style="list-style-type: none"> • Mortgage approvals for house purchase to average just over 60,000 per month. • The UK house price index to fall by just over 1¼% in the year to 2019 Q4. • Housing investment to fall by ½% per quarter, on average.
Business investment	Broadly unchanged
<ul style="list-style-type: none"> • Business investment to fall by ½% per quarter, on average. 	<ul style="list-style-type: none"> • Business investment to fall by ¼% per quarter, on average.
Trade	Revised up slightly
<ul style="list-style-type: none"> • The contribution of net trade to quarterly GDP growth to be close to zero, on average. 	<ul style="list-style-type: none"> • Net trade to provide a small positive contribution to quarterly GDP growth.

Chart 2.4 The slowdown in business investment growth has been relatively broad-based

Contributions to four-quarter growth in business investment by asset^(a)



Sources: ONS and Bank calculations.

(a) Chained-volume measure.

consumption is expected to be the main driver of growth, underpinned by continued real income growth, while business investment is expected to fall further as Brexit-related uncertainty continues to encourage firms to delay spending. The contribution from net trade picks up as world GDP growth stabilises, however. Government consumption is expected to contribute positively, partly reflecting the fiscal loosening announced in *Budget 2018*. The latest projections are conditioned on the tax and spending plans set out in the March 2019 Spring Statement, which contained little news for GDP.

2.2 Demand and the impact of Brexit-related uncertainties

Underlying demand growth appears to have slowed since mid-2018. This seems to have been driven largely by two factors: a slowing in the world economy (Section 1) and an increase in Brexit-related uncertainties. According to the latest *Deloitte CFO Survey*, 54% of CFOs rate the level of uncertainty as high or very high, compared to just 25% in 2018 Q2. That has weighed on business investment. Household spending and real income growth have been relatively resilient, and stronger than projected a year ago (Box 6), but there is some evidence that Brexit-related uncertainty has weighed on the housing market (Box 4).

Corporates

Business investment fell by 0.9% in Q4 (Table 2.B), the fourth consecutive quarter of decline. As noted in the *February Report*, business investment has been weak since the referendum, but that weakness has intensified since the middle of last year.

By asset, the recent slowdown in business investment has been relatively broad-based (Chart 2.4). Investment in ICT and machinery and intellectual property have fallen back. Investment in transport has remained very weak, driven by a fall in investment by airlines. The ONS suggests that this could reflect a structural shift in the way in which airlines acquire aircraft. In recent years, large UK airlines have increased the number of aircraft that they acquire through operating leases, rather than outright purchases.⁽¹⁾ Under this type of acquisition, the leasing company retains the economic ownership, and as many of these companies are based in the US and Ireland, most of this investment will not show up in the UK National Accounts.

Many of the determinants of business investment have remained supportive. The cost of finance is low relative to historical norms, rates of return on capital are robust, the labour market remains tight and survey measures suggest that firms are operating with limited spare capacity (Section 3). All of this should increase firms’ incentive to invest.

(1) ‘Business investment in the UK: analysis by asset’, ONS.

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

	Quarterly averages							
	1998– 2007	2008– 09	2010– 12	2013– 16 H1	2016 H2 –17	2018 H1	2018 Q3	2018 Q4
Household consumption ^(b)	0.8	-0.5	0.1	0.6	0.5	0.5	0.3	0.3
Private sector investment	0.7	-4.5	2.0	0.9	1.0	-0.1	-0.2	-0.8
<i>of which, business investment^(c)</i>	0.7	-3.4	2.2	0.4	0.5	-0.5	-0.6	-0.9
<i>of which, private sector housing investment</i>	0.6	-7.0	1.4	2.4	2.2	0.9	0.7	-0.7
Private sector final domestic demand	0.8	-1.1	0.5	0.8	0.6	0.4	0.2	0.1
Government consumption and investment ^(c)	0.9	0.8	-0.2	0.4	0.0	-0.6	0.8	1.1
Final domestic demand	0.8	-0.6	0.3	0.7	0.5	0.2	0.4	0.3
Change in inventories ^{(d)(e)}	0.0	0.0	0.1	0.0	-0.1	0.3	0.4	-0.2
Alignment adjustment ^(e)	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.6
Domestic demand^(f)	0.8	-0.7	0.4	0.7	0.4	0.5	0.6	0.3
'Economic' exports ^(g)	1.1	-1.3	1.0	0.8	1.1	-1.1	0.8	1.6
'Economic' imports ^(g)	1.4	-1.1	0.8	1.1	0.8	-0.1	0.7	2.1
Net trade^{(e)(g)}	-0.1	0.0	0.1	-0.1	0.1	-0.3	0.0	-0.2
Real GDP at market prices	0.7	-0.7	0.4	0.6	0.5	0.2	0.7	0.2
Memo: nominal GDP at market prices	1.2	-0.2	0.9	0.9	1.0	0.7	1.1	0.7

(a) Chained-volume measures unless otherwise stated.

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

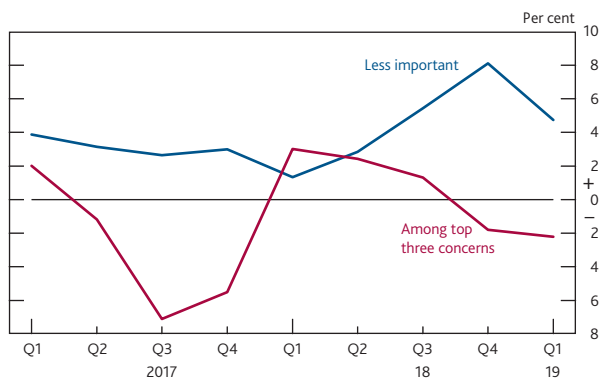
(c) Investment data take account of the transfer of nuclear reactors from the public corporation sector to central government in 2005 Q2.

(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.

Chart 2.5 The DMP Survey suggests that Brexit uncertainty has deterred business investmentAverage annual growth in capital expenditure^(a) by degree of concern about Brexit^(b)

Sources: DMP Survey and Bank calculations.

(a) Two-quarter moving average. Quarterly annual growth rates are estimated from firms' reported level of capital expenditure in the previous quarter and that in the same quarter a year ago.

(b) Question: 'How much has the result of the EU referendum affected the level of uncertainty affecting your business?'.

The weakness of business investment despite these supportive factors suggests that Brexit-related uncertainties have had an impact. Indeed, evidence from the Decision Maker Panel (DMP) Survey suggests that impact has increased over the past year. Investment by firms that viewed Brexit as an important source of uncertainty fell at the end of 2018, compared to a rise in investment among those firms that did not (Chart 2.5). Conditioned on a range of model specifications and other factors, the latest DMP Survey data suggested that the level of nominal investment may be between 6%–14% lower than it would have been in the absence of Brexit uncertainties.

Surveys suggest that investment will remain weak in the near term. For example, the Agents' scores for investment intentions in both the manufacturing and services sectors have fallen to their lowest level in nearly nine years.

How firms' investment intentions develop over the near term will be influenced by the time frame over which they expect Brexit uncertainty to be resolved. If, for example, businesses judge that uncertainty is likely to fade quickly, then they may reduce capital expenditure sharply as they wait for a resolution to emerge. In contrast, a more protracted period of uncertainty may lead to a less abrupt change in expenditure if companies judge it too costly to wait for any resolution to become apparent. Indeed, tentative evidence from the DMP Survey suggested that firms which expect Brexit uncertainty to be resolved in the next year have reported lower investment growth over the recent past than those who expect a resolution after 2019.

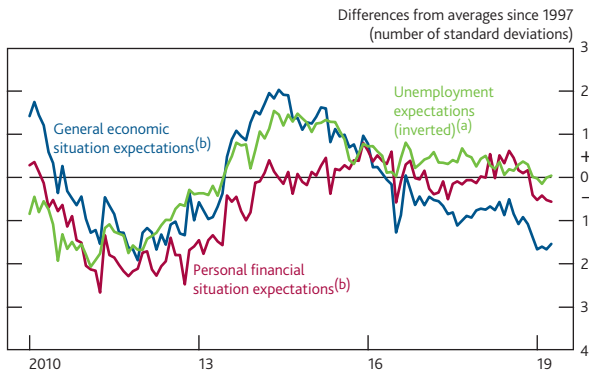
Firms' capital expenditure plans will also depend on their expectations about the nature of the UK's future relationship with the EU, and a resolution of uncertainty may not in itself lead to a recovery in investment. For example, if firms expect a much less open trading relationship with the EU, they may scale down investment and the size of their UK operations.

Households

While consumer confidence about the general economic situation has fallen since mid-2018, quarterly consumption growth has been steady, averaging 0.3%. This resilience is expected to continue in the near term, and consumption is expected to grow by 0.4% in 2019 Q1.

One possible reason for the resilience of consumption growth is that individuals' confidence about their personal financial situation has remained much stronger than that about the general economic situation, despite declining somewhat in recent months (Chart 2.6). That relative strength could reflect perceptions of high job security as the unemployment rate has remained low. Developments in households' savings — and therefore consumption relative to income — tend to broadly mirror movements in unemployment (Chart 2.7).

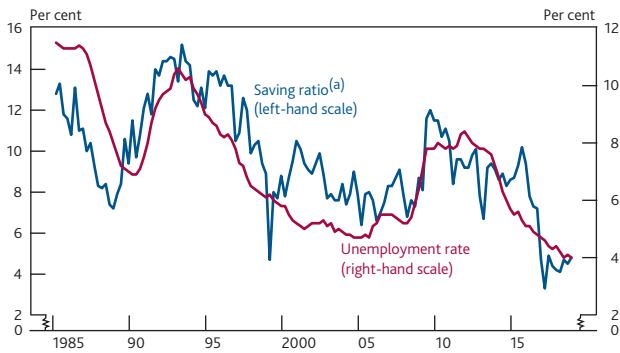
Chart 2.6 Households' confidence about their personal financial situation has fallen by less than that about the general economy
Indicators of consumer confidence



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

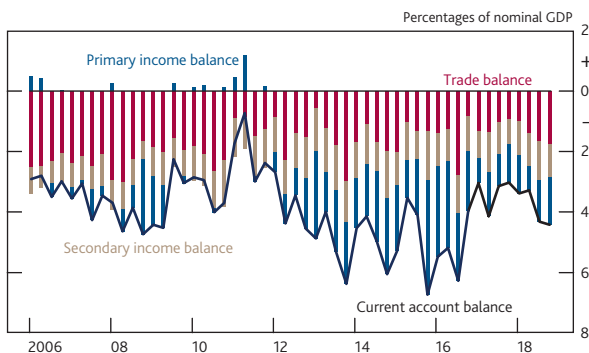
- (a) Net balances of respondents expecting that the number of people unemployed will rise over the next 12 months.
- (b) Net balance of respondents reporting that they expect their personal financial situation or the general economic situation to improve over the next 12 months.

Chart 2.7 The low level of the saving ratio may be linked to the low unemployment rate
The saving ratio and the unemployment rate



(a) Saving as a percentage of household post-tax income. Includes NPISH.

Chart 2.8 The current account deficit widened to 4.4% in 2018 Q4
UK current account



Consumption growth has been underpinned by real income growth. That is expected to continue over 2019, with consumption growth expected to remain close to current rates and the saving ratio to remain broadly flat. One risk to that projection is that the recent deterioration in households' sentiment about their personal financial situation, and the slight pickup in their unemployment expectations, continues.

Uncertainty might be expected to have a more significant effect on larger and more permanent purchases, such as housing and durable goods, than it does on everyday spending. The housing market has been weak since the referendum and there is evidence to suggest that Brexit-related uncertainties have weighed on house prices, alongside other factors (Box 4).

Growth in spending on durable goods decreased a little in the second half of 2018, quarterly growth averaged 0.9% compared to 1.3% in the first half of the year. A fall in car purchases accounts for a significant proportion of this decline. As noted in the *February Report*, this largely reflected supply issues related to a change in emissions regulations. The latest car registrations data suggest that spending on cars recovered in 2019 Q1.

Net trade and the current account

Net trade reduced quarterly GDP growth by 0.2 percentage points in 2018 Q4, and that drag is expected to have increased in 2019 Q1. As noted in Box 3, imports of goods from the EU have increased since the start of the year, probably reflecting stockbuilding by UK firms. Monthly data suggest that goods exports to non-EU countries fell sharply in the three months to February, likely reflecting weak global demand. That was partly offset by exports of goods to the EU picking up, as EU firms also appear to have stockpiled.

The current account deficit — which reflects the balance of nominal trade flows and other payments between the UK and the rest of the world — widened to 4.4% of GDP in 2018 Q4 (Chart 2.8). Since 2016, the UK has relied on substantial foreign capital inflows to fund the current account deficit. This poses risks to the UK economy. For example, a reduction in foreign investor appetite could lead to falls in UK asset prices and a tightening in domestic credit conditions. As discussed in the *November 2018 Financial Stability Report*, there is mixed evidence about investor appetite for UK assets since the EU referendum.

Box 3 Stockbuilding and its implications for the near-term growth outlook

In February, the MPC noted that shifting expectations about Brexit could lead to greater-than-usual short-term volatility in UK data, and that growth outturns in early 2019 may not provide a clear signal about underlying activity. One factor that could cause such volatility is stockbuilding. This box considers the latest evidence on stockbuilding and the associated implications for the near-term growth outlook.

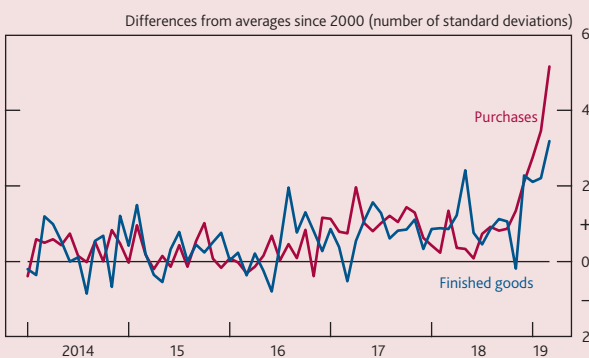
Recent trends in stockbuilding

Stockbuilding occurs when a business puts finished goods or raw materials to one side to hold in reserve, or when the volume of work in progress increases. Changes in companies' stock levels can result from unexpected fluctuations in demand, but may also reflect companies choosing to hold a different level of stocks.

A range of survey evidence suggests that uncertainty about Brexit — which could lead to disruption to cross-border supply chains — caused companies to increase their holdings of stocks in 2019 Q1. The stocks indices in the IHS Markit/CIPS manufacturing survey rose sharply to historical highs (Chart A). The Bank's Agents' latest survey on preparations for EU withdrawal showed that around half of all respondents had been building inventories as part of their contingency planning for Brexit (Box 5). Around 30% of respondents to the DMP Survey reported that they had built up their stocks due to Brexit, with 40% of those increasing stocks by more than 10%.

Chart A Surveys suggest that firms have been stockbuilding ahead of Brexit

IHS Markit/CIPS manufacturing survey^(a)



Sources: IHS Markit and Bank calculations.

(a) Net percentage of manufacturing companies reporting that stocks increased this month compared with the previous month.

The ONS data have yet to show a pickup in inventories, but these only run to 2018 Q4. Stockbuilding data need to be interpreted with care since quarterly estimates of this component of GDP are prone to large revisions.

Implications for the near-term growth outlook

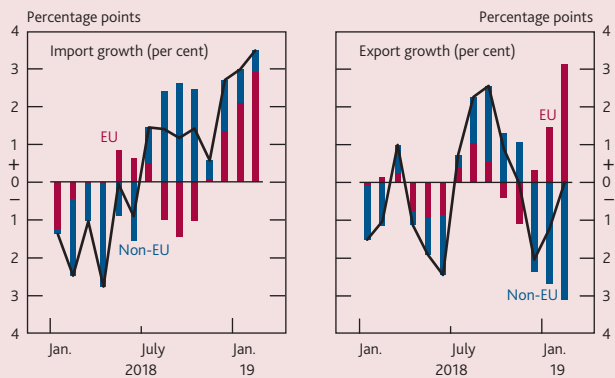
Arithmetically, stockbuilding increases GDP. But stockbuilding only increases GDP growth if the rise in stock levels is larger than in the previous period.

In February, the MPC had expected stockbuilding to pick up in 2019 Q1. That was expected to be concentrated in goods sourced from the rest of the EU, such that, on the demand side, higher stockbuilding would be largely offset by higher imports.

The latest data suggest that stockbuilding did pick up in 2019 Q1. But there appears to have been more stockbuilding than expected and while some stockbuilding does appear to have been sourced from elsewhere — imports of EU goods rose markedly (Chart B; left panel) — it also appears to have boosted domestic production. Manufacturing output rose in January and February, with the IHS Markit/CIPS survey attributing increased production to the build-up of inventories. It is also possible that stockbuilding activity has contributed to the recent rise in some components of services output such as distribution and warehousing. Stockpiling of goods by EU firms ahead of Brexit may also account for the recent strength in EU goods exports (Chart B; right panel).

Chart B The recent strength in EU goods imports and exports may reflect stockbuilding

Contribution to three-month on three-month growth in goods imports and exports by area of origin^(a)



(a) Chained-volume measures. Goods exports and imports are measured excluding trade in unspecified goods.

Any boost to GDP growth from Brexit-related stockbuilding in 2019 Q1 is likely to be temporary. If stockbuilding continues at the same pace in 2019 Q2, then the contribution of stockbuilding to GDP growth will fall to zero. If companies stockbuild at a slower pace, maintain their stock levels, or de-stock, then stockbuilding will drag on GDP growth in Q2, adding to short-term volatility in the data.

Overall, the MPC judges that stockbuilding has accounted for some of the recent unexpected strength in GDP growth, and that stockbuilding will drag on growth by a similar amount in 2019 Q2. The outlook for near-term growth remains more uncertain than usual.

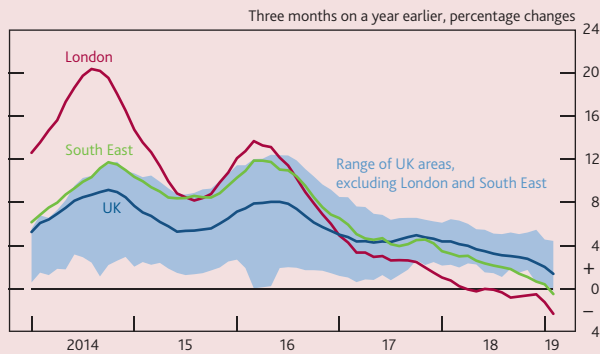
Box 4

The housing market and its impact on GDP

Since the referendum, while housing transactions have remained broadly flat, annual house price inflation has slowed to 1.4% in the three months to February (Chart A), the slowest rate since 2013. Housing investment growth has been solid over much of this period, but it has slowed more recently.

Chart A House price inflation has slowed

UK house prices by area^(a)



Sources: HM Land Registry and Bank calculations.

(a) Data for Northern Ireland are available on a quarterly basis up to 2018 Q4 and are seasonally adjusted by Bank staff.

What has driven the slowdown in house price inflation?

The slowdown in house price inflation is likely to have been partly driven by factors affecting the demand for housing.

Market intelligence suggests that Brexit-related uncertainty has had an impact on demand. Around 80% of respondents to the Royal Institution of Chartered Surveyors (RICS) survey in February cited this as one of the two biggest challenges currently facing the market. Given the relatively large costs associated with buying and selling houses, some households are likely to have delayed buying or moving house.

Affordability constraints are also likely to have had an effect. The slowing in house price inflation has been most pronounced in areas with higher pre-referendum prices relative to incomes, such as London and the South East (Chart A).

Policy changes made to the buy-to-let market over 2016–17, such as increases in stamp duty on second properties and lower mortgage interest tax relief, have reduced demand. Buy-to-let mortgage completions were around 40% lower in 2018 than in 2015.

In addition to reduced demand, an increase in housing supply may also have weighed on prices. House building held up following the referendum, and in the year to April 2018,

222,000 dwellings were added to the housing stock in England, only just below the series high of 224,000 in 2008. Contacts of the Bank's Agents have reported that in some regions, such as Southern England, an excess supply of housing has led to a widening gap between asking and offered prices.

How will this impact GDP?

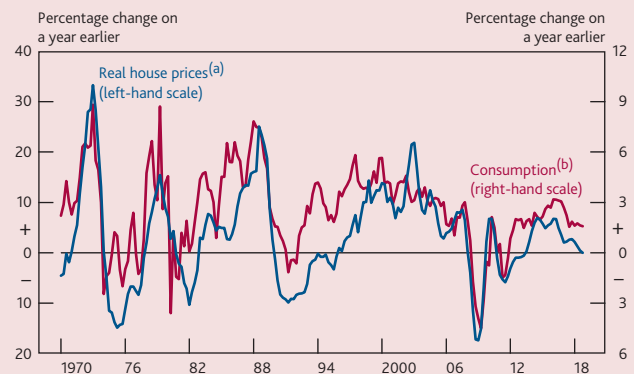
The housing market affects GDP through consumption and housing investment.

Consumption

House price inflation and consumption growth have been correlated in the past (Chart B). This is largely because decisions about whether to spend on housing and consumption both share common drivers such as income growth and confidence.

Chart B House price inflation has been correlated with consumption in the past

Real UK house prices and consumption



Sources: HM Land Registry, ONS and Bank calculations.

(a) Real house prices are calculated as the UK house price index divided by the consumer expenditure deflator (including NPISH).

(b) Chained-volume measure, including NPISH.

Higher prices can also boost consumption directly via a *collateral channel*,⁽¹⁾ whereby higher prices generate greater housing equity that households can borrow against to finance spending. Bank analysis finds the effect of this channel to be fairly small, however: a 10% increase in house prices is estimated to raise consumption by between 0.35%–0.5%. In addition, consumption may also be affected through a *durable goods channel*, as people moving house might also be more likely to buy white goods, for example. The effect of this channel is estimated to be very small.⁽²⁾

Since the EU referendum, consumption growth has remained relatively resilient, while house price inflation has fallen. That

(1) Evidence for the collateral channel is described in Benito, A and Mumtaz, H (2006), 'Consumption excess sensitivity, liquidity constraints and the collateral role of housing', *Bank of England Working Paper No. 306*.

(2) There is also a potential distributional wealth channel from house prices to spending. But as discussed in 'The housing market and household spending' box in the November 2016 Report, there is little evidence of this in the data.

seems consistent with the collateral and durable goods channels being quite small, but it is still somewhat unusual given that they tend to share common drivers.

One reason for the difference may be that Brexit-related uncertainty about the general economic situation — which has been elevated since the referendum — is relatively more important for large, hard-to-reverse spending such as on housing than it is for day-to-day expenditure.

Another reason may be that part of the weakness in the housing market has been driven by market-specific issues, such as the buy-to-let tax changes and affordability constraints. These housing-specific shocks will only affect consumption through the relatively weak collateral channel.

Housing investment

Developments in the housing market will contribute directly to GDP through housing investment. Around four fifths of housing investment consists of new house building and improvements to existing buildings by the public and private sector (*dwelling investment*). The remainder consists of spending associated with housing transactions, such as estate agents and legal fees (*other investment*).

Although housing investment only accounts for around 5% of GDP, it is volatile and has contributed significantly to economic cycles. For example, the 40% fall in housing investment during the 2008–09 recession accounted for about one quarter of the fall in GDP (Chart C). This volatility largely arises because small changes in the desired housing stock require large changes in housing investment.⁽³⁾

As noted above, house building held up following the referendum, contributing to robust growth in total housing investment (Chart D). This growth has been stronger than simple models based on transactions and prices would predict. Intelligence from the Bank’s Agents suggests that this may in part reflect the impact of the Help to Buy equity scheme, which has supported first-time buyer demand. It is also possible that some of the strength in house building may also reflect other factors such as changes in planning restrictions, a boost from the high level of house prices, or ‘catch-up’ from the low rates of house building immediately following the crisis.

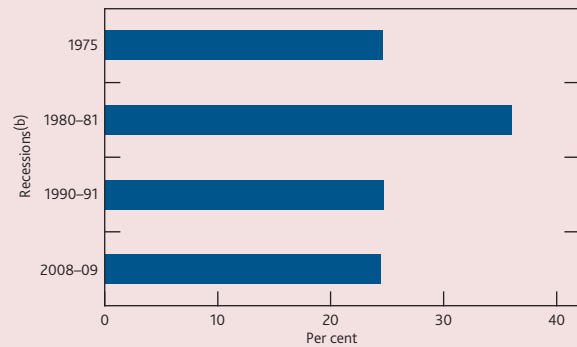
Housing investment growth has weakened over 2018, driven by a slowing in dwellings investment growth (Chart D). This is likely to reflect increased uncertainty around the outlook for the housing market: the Bank’s Agents report that some large developers have begun to scale back planned projects.

Outlook

In the MPC’s central projection, house price inflation and housing investment growth are expected to fall further in the

Chart C Housing investment can contribute significantly to swings in the economic cycle

Proportion of falls in GDP during recessions that can be accounted for by housing investment^(a)

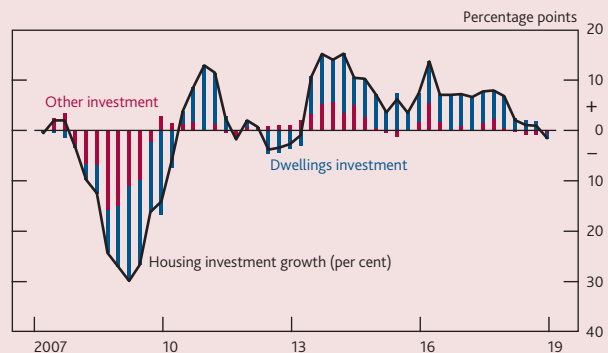


Sources: ONS and Bank calculations.

- (a) Housing investment is defined as the sum of dwellings investment (DFEG) and transfer of ownership costs (L635 + L637). Prior to 1997, quarterly data for transfer of ownership costs does not exist. As such, the contributions for dates prior to this are calculated solely using DFEG.
- (b) Recessions defined as two or more consecutive quarters of negative growth. The 2008–09 recession spans from 2008 Q2–2009 Q2, the 1990–91 recession spans 1990 Q3–1991 Q3, the 1980–81 recession spans 1980 Q1–1981 Q1, the 1975 recession spans 1975 Q2–1975 Q3.

Chart D Housing investment growth held up following the referendum, but has weakened over 2018

Contributions to four-quarter growth in housing investment^(a)



(a) Chained-volume measure.

near term. That is consistent with indicators such as the RICS survey and housing starts. Further out, both are expected to pick up as headwinds from uncertainty dissipate and stronger income growth supports the demand for housing.

There are of course risks around these forecasts. On the one hand, more persistent uncertainty could weigh on house prices, and housing investment could fall by more than projected ahead of the withdrawal of the Help to Buy scheme. On the other hand, a more rapid dissipation of uncertainty could lead to a stronger pickup in house price inflation and housing investment growth.

(3) Corder, M and Roberts, N (2008), ‘Understanding dwellings investment’, *Bank of England Quarterly Bulletin*, 2008 Q4.

Box 5 Agents' update on business conditions

The key information from Agents' contacts considered by the Monetary Policy Committee ahead of its May policy decision is highlighted in this box.⁽¹⁾

Recent developments

Annual output growth appeared to have edged down in the first quarter of 2019 with a broad-based softening across business services and production sectors.⁽²⁾

Consumption growth remained broadly stable in Q1 and consumer confidence was resilient. But negative sentiment among buyers and potential sellers added to the weakness in the housing market.

Brexit and political uncertainties pushed down on already weak investment intentions. Some contacts anticipated that once greater clarity about the outcome of Brexit emerges, there will be a catch-up as previously delayed investment is given the green light.

Pay growth remained reasonably strong but had stabilised in recent months, with settlements clustering around 3%. This stabilisation partly reflected a slight easing in recruitment difficulties.

Agents' survey on preparations for EU withdrawal

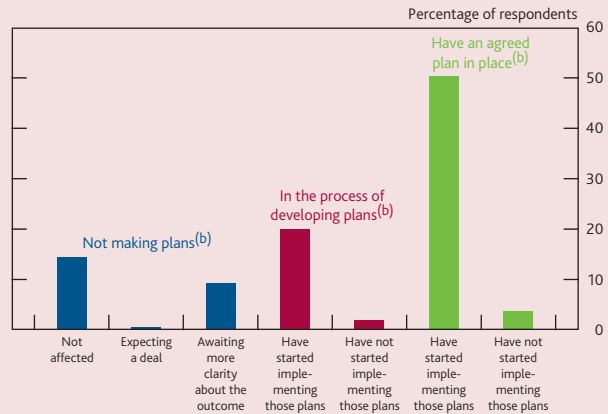
The Agents surveyed 360 business contacts on their preparations for EU withdrawal.⁽³⁾ This followed similar surveys in December 2018, January and March 2019.

In the latest sample of companies, three quarters of respondents reported that they had done some form of contingency planning — either with 'an agreed plan in place', or 'in the process of developing one' (Chart A). That was similar to the results in March, but up from just under a half of respondents in the January survey.

A quarter of respondents said they were not making contingency plans, more than half of which reported that they were not affected by Brexit, while a third were awaiting more clarity about the outcome of Brexit.

Contingency planning for Brexit appeared to be relatively well advanced across all sectors in the latest survey. By size of business, the survey showed that smaller firms had typically undertaken less contingency planning than large firms. A lack of resources and lower perceived benefits were reasons cited by smaller firms for undertaking limited contingency planning.

Chart A Most firms have contingency plans for Brexit
Contingency planning for a 'no deal, no transition' Brexit^(a)

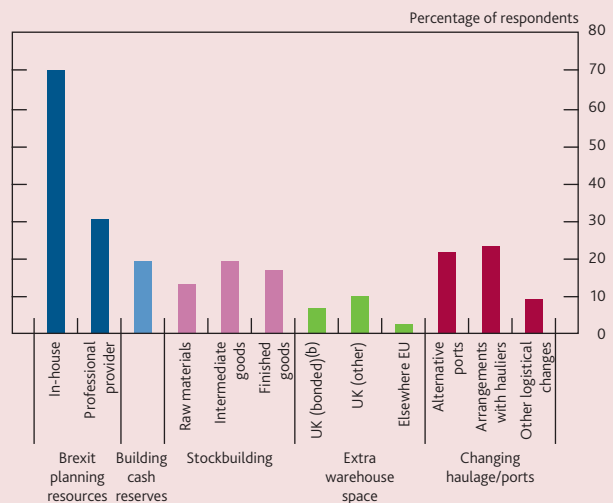


(a) Companies were asked 'How advanced is your contingency planning for a 'no deal and no transition' Brexit?'.
(b) The question asked about 'plans for the end of March 2019'.

Nearly three quarters of all respondents had devoted in-house resources to contingency planning for Brexit in the most recent survey (Chart B (i)). Around a third of respondents had used external advisory services, consistent with increased demand for professional services reported by Agents' contacts in that sector.

Chart B (i) Most firms have allocated planning resources to Brexit

Types of contingency actions being undertaken or planned^(a)



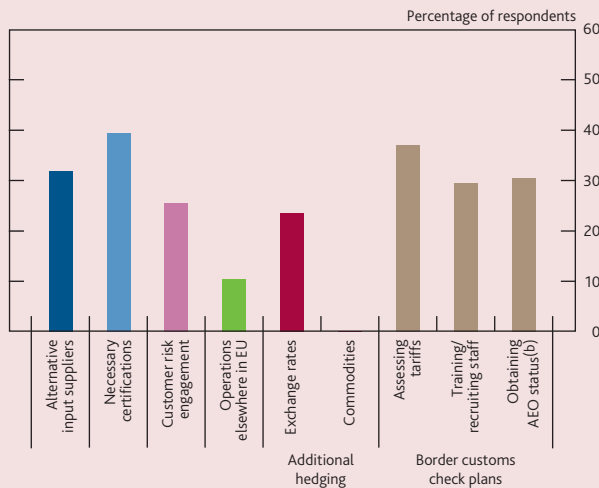
(a) Respondents were asked to select all actions that applied from a range of options. As a result, the figures are not additive.
(b) A bonded warehouse allows traders to store goods with duty or import payments suspended.

(1) A comprehensive quarterly report from the Agents on business conditions is published alongside the MPC decision in non-*Inflation Report* months. The next report will be published on 20 June 2019.
(2) References to activity and prices relate to the past three months compared with a year earlier. The Agents' scores are available [here](#).
(3) The survey was conducted between 2 March and 8 April 2019. The companies involved had 545,000 employees and a combined UK turnover of £137 billion. Responses were weighted by employment and then by sector.

Relative to previous surveys, more businesses reported taking actions related to preparations for cross-border checks, including assessing tariffs, training/recruiting staff to handle paperwork and obtaining Authorised Economic Operator status (Chart B (ii)).

Chart B (ii) Firms are undertaking a range of measures to prepare for Brexit

Types of contingency actions being undertaken or planned^(a)



(a) Respondents were asked to select all actions that applied from a range of options. As a result, the figures are not additive.
 (b) Authorised Economic Operator (AEO) status is an internationally recognised quality mark that gives companies quicker access to some customs, safety and security procedures.

Two thirds of respondents felt that they were ready for a 'no deal, no transition' Brexit. But of those firms, a third reported that they were only 'as ready as we can be', while a third thought that they would not be affected.

As in previous Agents' surveys, even those respondents who reported being 'ready' thought on average that output and employment would fall substantially over the next year in a 'no deal, no transition' scenario. In the April survey, a net percentage balance of -28% of firms expected output to fall and -17% of firms expected employment to shrink if there was no deal and no transition, while they expected both to rise in a scenario with a deal and transition (Chart C).

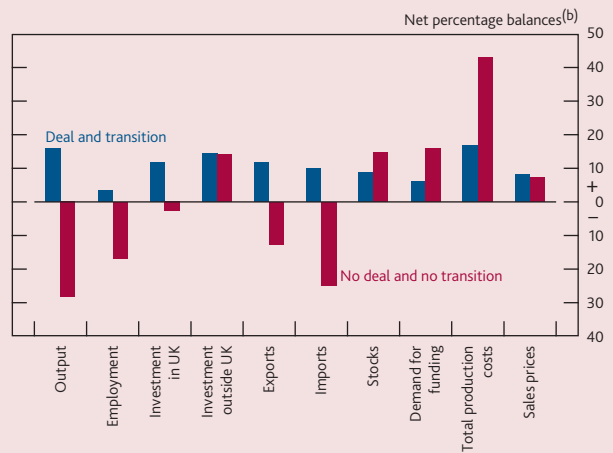
Responses to questions on the availability and cost of working capital or trade finance over the past three months were similar to previous vintages of the survey. Around three quarters of companies who answered the question reported no change, with just under a quarter reporting that working capital or trade finance had become more expensive or less available.

Business response to Article 50 extension

The latest Agents' survey ran until 8 April, before the decision to extend the negotiation period for the UK's withdrawal from

Chart C Output and employment are expected to fall sharply in a 'no deal, no transition' Brexit

Expectations for the impact on business of Brexit^(a)



(a) Companies were asked 'Relative to the last 12 months, what is the likely impact on the following for your business over the next year in each scenario: (a) a deal and transition period and (b) no deal and no transition period?' For each relevant business factor, respondents were asked to choose between 'Fall greater than 10%', '-10 to -2%', 'Little change', '+2 to +10%', and 'Rise greater than 10%'.
 (b) Net percentage balances of companies reporting increases or declines in each factor, weighted by employment. Half weight was given to the ±2%–10% response and full weight was given to those that responded 'Rise/Fall greater than 10%'.

the EU was announced on 11 April. Since that time the Agents have spoken to businesses on their response to the delay. While the intelligence gathered is based on a small sample of companies, responses suggest that very few companies plan to completely reverse their contingency plans for Brexit.

There were mixed views on what businesses would do with any extra stocks that had been built up. Some retailers were considering running down stocks, while contacts in manufacturing said they would maintain enhanced stock levels given the costs of building them.

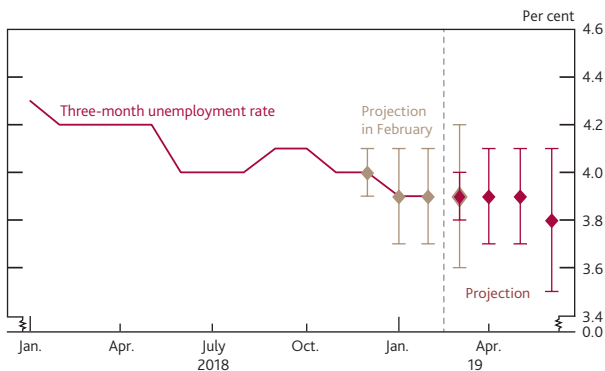
Since the delay was announced, most contacts had not yet re-planned their capital spending for 2019. Most thought that uncertainty would persist for some time. But some businesses suggested that they might be inclined to reinstate some paused investment.

3 Supply and spare capacity

- Employment growth has been stronger than expected, despite relatively soft activity growth and Brexit uncertainties, and the labour market remains tight.
- The MPC judges that a small margin of excess supply has begun to emerge in 2019, and that will persist in the near term. Thereafter, excess demand builds.
- Productivity growth has remained weak. It is projected to continue to be muted in the near term before picking up gradually.

Chart 3.1 The unemployment rate has fallen to 3.9%, and is expected to decline a little further in Q2

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 December 2018 and January, February and March 2019 at the time of the February 2019 Report. The red diamonds show the current staff projections for the headline unemployment rate for the three months to March, April, May and June 2019. The bands on either side of the diamonds show uncertainty around those projections based on ± 1 root mean squared error of past Bank staff projections for the three-month headline unemployment rate.

As discussed in the *February Report*, the MPC judged that demand and supply were broadly in balance around the turn of the year, based on the evidence from both statistical filtering techniques and the components of spare capacity. A small margin of spare capacity has begun to emerge in 2019, as underlying demand growth has been soft (Section 2), and this persists in the near term. Thereafter, demand growth rises above the modest rate of potential supply growth and excess demand builds (Section 5).

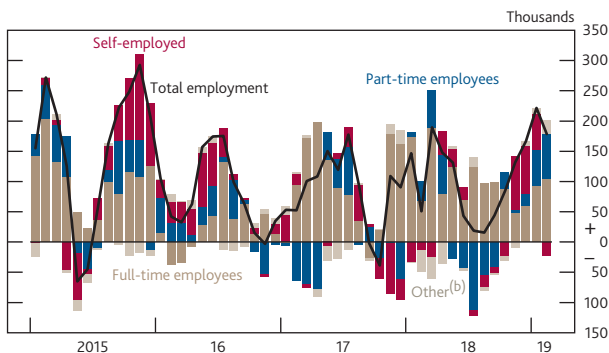
3.1 Labour market: developments and prospects

Recent developments

Since the *February Report*, the unemployment rate has fallen slightly, to 3.9% in the three months to February, as expected (Chart 3.1). That is a little below the MPC's assessment of the equilibrium rate of unemployment — of 4¼% — that would be consistent with inflation at the target. A range of other indicators also point to labour market conditions remaining tight (Table 3.A).

Chart 3.2 Employment has been strong in recent months

Decomposition of change in employment^(a)



(a) Three months on previous non-overlapping three months.

(b) Comprises unpaid family workers and those on government-supported training and employment programmes classified as being in employment.

Employment growth has been strong in recent months. Employment grew by 0.5% in the three months to February, and is expected to have grown by 0.4% in Q1 as a whole. This compares with a projection of 0.2% growth in the *February Report*. Over much of the past two years, employment growth has mainly reflected more full-time employees (Chart 3.2).

Alongside the rise in employment, the participation rate increased relative to three months ago — to 64.0% — and by more than had been projected. Part of this reflected revisions due to a reweighting of the Labour Force Survey (LFS) to take into account the latest population data. Much of the increase in participation in the labour market relative to three months ago was accounted for by those aged 50 and over.

Table 3.A The labour market remains tight
Selected measures of labour demand and labour market tightness

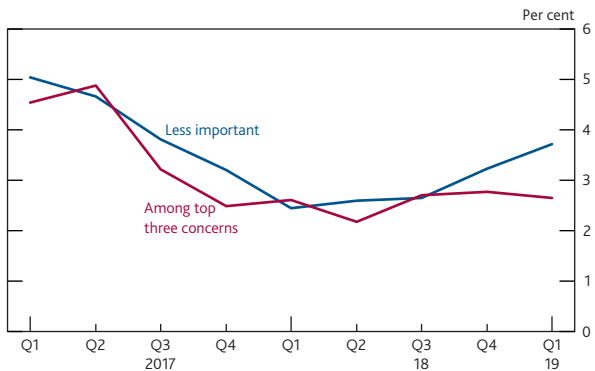
	Quarterly averages					2018				2019
	2000–07	2008–09	2010–12	2013–14	2015–17	Q1	Q2	Q3	Q4	Q1
Change in employment (thousands)^(a)	70	-59	67	130	101	189	43	44	167	138
of which, employees	55	-67	32	106	80	251	27	58	80	n.a.
of which, self-employed and other ^(b)	16	7	35	24	21	-61	16	-14	87	n.a.
Surveys of employment intentions^(c)										
Agents ^(d)	0.8	-1.7	0.3	0.9	0.5	0.4	0.2	0.3	0.2	0.1
BCC ^(e)	19	-3	8	26	23	23	24	22	21	19
CBI ^(e)	3	-20	-3	17	17	18	11	7	15	5
Job-to-job flows^(f)	2.77	2.00	1.84	2.15	2.43	2.28	2.45	2.53	2.43	n.a.
Vacancies to labour force ratio^(g)	2.09	1.70	1.48	1.85	2.28	2.43	2.47	2.50	2.51	2.50
Redundancies to employees ratio^(h)	0.63	0.79	0.60	0.46	0.41	0.35	0.36	0.31	0.33	0.32
Surveys of recruitment difficulties^(c)										
Agents ⁽ⁱ⁾	1.5	-2.5	-1.1	0.4	1.8	2.6	2.5	2.7	3.3	3.3
BCC ^(j)	61	55	51	57	65	62	64	73	72	72
CBI, skilled ^(k)	27	15	16	23	33	30	29	30	33	29
CBI, other ^(k)	8	2	2	3	9	10	9	8	10	10

Sources: Bank of England, British Chambers of Commerce (BCC), CBI, CBI/PwC, ONS and Bank calculations.

- (a) Changes relative to the previous quarter. Figure for 2019 Q1 is Bank staff's projection, based on data to February.
- (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) Proportion of people who reported being in a job three months ago who report being in a job for less than three months.
- (g) Vacancies as a percentage of the workforce, calculated using rolling three-month measures. Data start in 2001 Q2. Excludes vacancies in agriculture, forestry and fishing. Figure for 2019 Q1 shows vacancies in the three months to March relative to the size of the labour force in the three months to February.
- (h) Redundancies as a percentage of total LFS employees, calculated using rolling three-month measures. Figure for 2019 Q1 is for the three months to February.
- (i) 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.
- (j) Percentage of respondents reporting recruitment difficulties over the past three months.
- (k) 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 The DMP Survey suggests that Brexit uncertainty has had a modest negative effect on employment growth

Average annual growth in employment^(a) by degree of concern about Brexit^(b)



Sources: DMP Survey and Bank calculations.

- (a) Two-quarter moving average. Annual growth in employment is estimated from the number of people businesses report they currently employ (including part-time), and how many people they report employing 12 months ago.
- (b) Respondents were asked 'How much has the result of the EU referendum affected the level of uncertainty affecting your business?'

Participation is projected to remain at around current rates over the three years of the forecast period. This reflects the net result of two offsetting factors: the ageing of the population, which will tend to pull down on participation rates; and increases in participation within older age groups.

The strength in employment growth in recent months has occurred alongside soft demand growth, and has therefore been associated with sluggish productivity growth (Section 3.2). The employment strength contrasts with the weakness in investment growth (Section 2).

Brexit-related uncertainty is weighing on both investment and employment. Decisions to hire and invest both involve a degree of commitment, which means that there is value in postponing them in the face of uncertainty. However, this uncertainty is likely to be weighing more heavily on investment than employment, given that decisions about employment tend to be less costly to reverse.⁽¹⁾

Responses to the Bank's latest Decision Maker Panel (DMP) Survey are consistent with this: companies that report Brexit as a top-three concern have seen employment grow by slightly less (Chart 3.3), and investment grow by appreciably less, than those who do not. The size of this effect on aggregate employment growth is uncertain: analysis by Bank staff suggests that this could have reduced private sector employment by anywhere between ½% and 2% since the EU referendum, compared with an estimated 6%–14% reduction in investment from Brexit uncertainty. Companies that report that they have reduced employment because of Brexit have tended to do so through lower hiring rather than lay-offs (Chart 3.4).

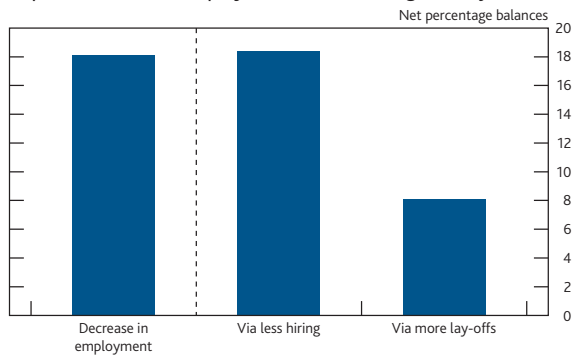
The changing composition of new hires also provides evidence of how uncertainty appears to be affecting employment decisions. In the past, increases in uncertainty have tended to be associated with a greater proportion of temporary new staff placements relative to those that are permanent.⁽²⁾ The REC survey suggests this relationship has continued recently.

The strength of employment growth relative to investment growth does not appear to reflect individual firms employing more labour as a substitute for investment, according to responses to the latest DMP Survey. It is possible, however, that compared with the past, companies for which production is more labour-intensive have been growing more quickly relative to those for which it is more capital-intensive. To the extent that this has been the case, it might have contributed to the strength in employment growth relative to that of investment.

(1) See, for example, Vlieghe, G (2019), 'The economic outlook: fading global tailwinds, intensifying Brexit headwinds'.

(2) See Broadbent, B (2016), 'Uncertain times'.

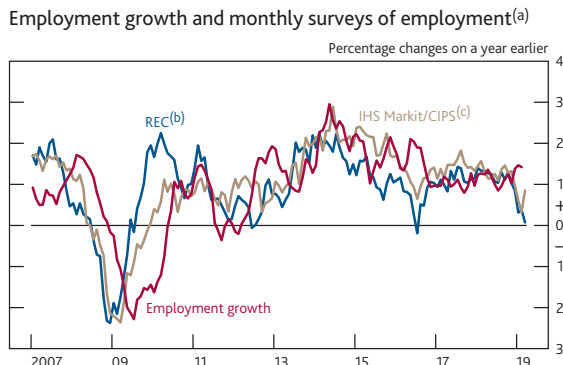
Chart 3.4 Uncertainty has affected hiring more than lay-offs
Impact of Brexit on employment, and the margin of adjustment^(a)



Sources: DMP Survey and Bank calculations.

(a) Respondents were asked: 'Looking back, could you say how the UK's decision to vote 'leave' in the EU referendum has affected your overall employment, recruitment of new employees and lay-offs of existing employees since the referendum?'

Chart 3.5 Employment surveys have weakened, in contrast to the official data
Employment growth and monthly surveys of employment^(a)



Sources: Bank of England, IHS Markit/CIPS, KPMG/REC Report on Jobs, ONS and Bank calculations.

- (a) Surveys of employment intentions have been adjusted to match the mean and standard deviation of official employment growth since January 1998.
 (b) Recruitment agencies' reports on the demand for staff placements compared with the previous month. Produced by weighting together survey indices for permanent and temporary placements using employment shares.
 (c) PMI composite employment index.

Table 3.B Potential supply growth has been subdued since the financial crisis

Decomposition of estimated potential supply growth^(a)

	Quarterly averages				
	1998–2007	2008–10	2011–14	2015–18	2019–22 Q2
Potential supply growth^(b)	2.9	0.2	1.6	1.7	1.5
of which, potential labour supply growth	0.7	0.1	1.5	1.0	0.6
of which, population	0.7	0.9	0.7	0.6	0.5
of which, participation	0.1	-0.1	0.0	0.2	0.0
of which, unemployment ^(c)	0.2	-0.4	0.3	0.3	0.1
of which, average hours	-0.3	-0.3	0.4	-0.1	0.0
of which, potential productivity growth	2.2	0.1	0.1	0.6	0.9
of which, capital deepening ^{(d)(e)}	1.1	0.7	0.2	0.5	0.5
of which, total factor productivity ^{(d)(f)}	1.0	-0.6	-0.1	0.2	0.4

Sources: ONS and Bank calculations.

- (a) Average percentage point contributions to annual growth unless otherwise specified. Contributions may not sum to the total due to rounding.
 (b) Percentage changes on a year earlier.
 (c) Positive numbers indicate that a fall in the equilibrium unemployment rate has increased potential labour supply.
 (d) The decomposition is based on a growth-accounting framework using a constant returns to scale Cobb-Douglas production function, with total output to capital elasticity of $\frac{1}{3}$. Total factor productivity is a residual.
 (e) Capital deepening refers to growth in capital services per person-hour. Capital includes structures, machinery, vehicles, computers, purchased software, own-account software, mineral exploration, artistic originals and R&D. Calculations are based on Oulton, N and Wallis, G (2016), 'Capital stocks and capital services: integrated and consistent estimates for the United Kingdom, 1950–2013', *Economic Modelling*.
 (f) Total factor productivity growth refers to improvements in the efficiency with which both capital and labour are used to produce output.

Near-term prospects

Most employment surveys have softened somewhat since the start of the year. In particular, the employment components of the monthly IHS Markit/CIPS and REC surveys have weakened materially (**Chart 3.5**). This might reflect soft GDP growth (Section 2). It may also be a consequence of companies finding it hard to recruit. Indicators of labour demand have remained strong — for example, the number of vacancies continues to be above historical levels — and that has been associated with surveys suggesting that recruitment difficulties remain elevated (**Table 3.A**). Further, the KPMG/REC *Report on Jobs* found that staff availability had continued to decline sharply, with recruiters citing Brexit-related uncertainty, fewer EU workers and a high employment rate as factors.

The recent softening in the surveys stands in contrast to the official estimates of strong employment growth in the three months to February, although such divergences are not uncommon. Both the employment surveys and the LFS are subject to sampling variability that may cause estimates to differ from actual employment growth. The LFS response rate has been declining in recent years which may have increased this variability.⁽³⁾ However, the surveys may be erratically weak and recover as Brexit uncertainty wanes. For example, immediately after the EU referendum, a number of surveys fell sharply, while the official data they relate to did not.

The surveys may also contain some signal about future employment growth, which appears to have been the case at points in the past (**Chart 3.5**). Given that, employment growth is projected to slow in Q2, although it is expected to pick up a little thereafter.

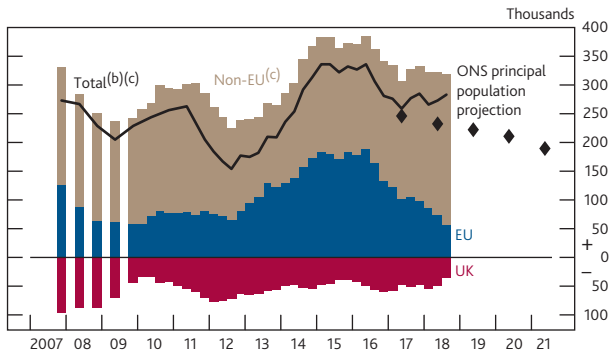
3.2 The outlook for potential supply

In its annual reassessment of supply-side conditions in February, the MPC judged that growth in the potential supply capacity of the economy — which is determined by the quantity of labour available and the amount of output that those in employment can produce — was likely to remain modest, averaging around 1½% in the central projection.

Labour supply growth was projected to be subdued relative to recent years (**Table 3.B**), with almost all of it expected to come from population growth. The MPC's forecast is conditioned on the ONS's principal population projection, published in 2017. The projection implies a further slowing in net migration over the next few years, to 189,000 in the year to 2021 Q2 (**Chart 3.6**). In the latest data, net migration was 283,000 in the year to 2018 Q3, somewhat higher than the ONS principal projection. Net migration from the EU continued to decline as it has done since the referendum,

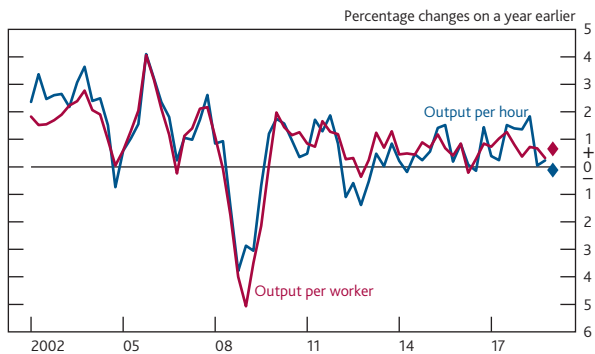
(3) ONS (2018), 'Labour Force Survey performance and quality monitoring report: October to December 2018'.

Chart 3.6 Net migration from the EU has slowed
Decomposition of net inward migration by citizenship^(a)



(a) Rolling four-quarter flows. Data are half-yearly to December 2009 and quarterly thereafter, unless otherwise stated. Figures by citizenship do not sum to the total prior to 2012.
 (b) Data are half-yearly to December 2011 and quarterly thereafter.
 (c) Includes adjustment to non-EU student migration data due to an unusual pattern in the International Passenger Survey data. See the [ONS guidance note](#) for more details.

Chart 3.7 Productivity growth has remained weak
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 2019 Q1, based on data to February.

reflecting both lower inflows to the UK and increased outflows. Intelligence from the Bank's Agents suggests that this decline in EU migration has exacerbated labour shortages in some sectors.⁽⁴⁾

In February, the MPC revised down its near-term projections for productivity growth. Over the past decade, much of the weakness in UK potential supply growth relative to the decade prior to the crisis can be accounted for by slower productivity growth (Table 3.B), which has often been weaker than projected (Box 6). Since February, productivity growth has remained weak: in the year to 2019 Q1 it is estimated to have increased by 0.7% on a per-head basis and decreased by 0.1% when measured per hour (Chart 3.7).

In the MPC's projections, four-quarter potential productivity growth picks up gradually to around 1% towards the end of the forecast period (Section 5). The improvement in productivity growth is supported by higher investment, and also reflects an expected increase in the efficiency with which capital and labour are used to produce output — total factor productivity growth. That could be boosted by higher research and development expenditure over recent years.

The outlook for productivity growth is likely to be sensitive to the nature of the UK's future trading relationship with the EU. As described in the box on pages 31–32 of the *November 2018 Report*, reductions in openness as the UK's trading relationship with the EU changes are likely to reduce the economy's productive capacity for a period of time. While such changes in supply could emerge relatively slowly in the event of a smooth withdrawal, a disorderly exit could severely impair the productive capacity of UK businesses.⁽⁵⁾

Table 3.C Monitoring the MPC's key judgements

Developments anticipated in February during 2019 Q1–2019 Q3	Developments now anticipated during 2019 Q2–2019 Q4
Unemployment	Revised down
• Unemployment rate to average around 4%.	• Unemployment rate to average around 3¾%.
Participation	Revised up
• Participation rate to average around 63½%.	• Participation rate to remain around 64%.
Average hours	Broadly unchanged
• Average weekly hours worked to remain around 32.	• Average weekly hours worked to remain around 32.
Productivity	Broadly unchanged
• Cumulative growth in hourly labour productivity to be ¼% to ½%.	• Quarterly hourly labour productivity growth to average ¼%.

(4) *Agents' summary of business conditions 2019 Q1*.

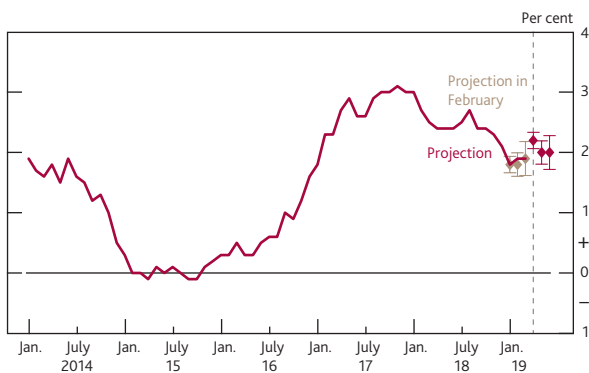
(5) For details, see 'EU withdrawal scenarios and monetary and financial stability: a response to the House of Commons Treasury Committee'.

4 Costs and prices

- CPI inflation was 1.9% in March, a little below the 2% target.
- Inflation is projected to dip further below 2% during the first half of the forecast period, largely reflecting lower expected retail energy prices.
- In the medium term, building excess demand leads to a firming of domestic inflationary pressures and pushes inflation above the target.

Chart 4.1 CPI inflation is expected to remain close to the target in the coming months

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

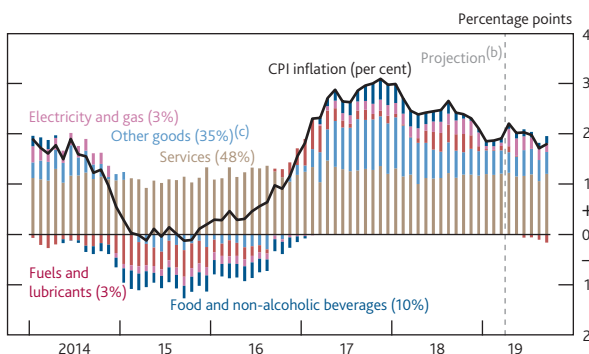


Sources: ONS and Bank calculations.

(a) The beige diamonds show Bank staff's central projection for CPI inflation in January, February and March 2019 at the time of the February 2019 *Inflation Report*. The red diamonds show the current staff projection for April, May and June 2019. The bands on each side of the diamonds show the root mean squared error of the projections for CPI inflation one, two and three months ahead made since 2004.

Chart 4.2 CPI inflation is expected to dip further below the target in Q3

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 2019 and may not sum to 100 due to rounding.
 (b) Bank staff's projection. Fuels and lubricants estimates use Department for Business, Energy and Industrial Strategy petrol price data for April 2019 and are then based on the May 2019 *Inflation Report* sterling oil futures curve, shown in Chart 4.3.
 (c) Difference between CPI inflation and the other contributions identified in the chart.

4.1 Consumer price developments and the near-term outlook

After falling markedly over 2018, CPI inflation has been relatively stable at rates close to the target at the start of 2019. CPI inflation was 1.9% in March. It was also 1.9% in Q1 as a whole, marginally higher than the February 2019 forecast (Chart 4.1).

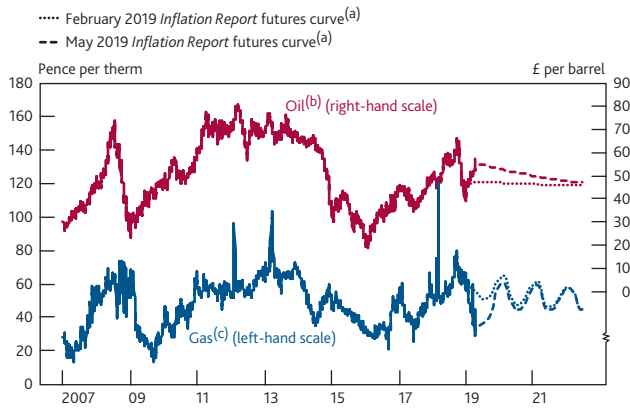
Inflation is expected to remain close to the target in the near term, with changes expected to be driven by energy price moves (Section 4.2). CPI inflation is expected to rise temporarily above the target in April, largely due to an increase in the Ofgem energy price cap which pushes up retail gas and electricity prices. CPI inflation is expected to dip below 2% in Q3 (Chart 4.2).

CPI inflation over the first half of the forecast is expected to be lower than projected in February, largely reflecting expected developments in retail energy prices. Wholesale gas and electricity prices have both fallen by around a third since the run-up to the February *Report* and that is expected to feed into retail prices. In addition, the 1½% appreciation of sterling since the February *Report* (Section 1) means that imported cost pressures — which are still judged to be pushing up inflation as a result of sterling's previous referendum-related depreciation — ease slightly more rapidly than previously projected.

Over the rest of the forecast period, domestic cost pressures are expected to build (Section 4.3), pushing CPI inflation above the 2% target. Inflation expectations, which can influence wage and price-setting decisions, remain consistent with inflation being around the target in the medium term (Section 4.4).

Chart 4.3 Sterling oil prices have risen since February, while wholesale gas prices have fallen

Sterling oil and wholesale gas prices



Sources: Bank of England, Bloomberg Finance L.P., Eikon from Refinitiv and Bank calculations.

- (a) Fifteen working day averages to 30 January and 24 April 2019 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.

4.2 Energy and import prices

Energy prices

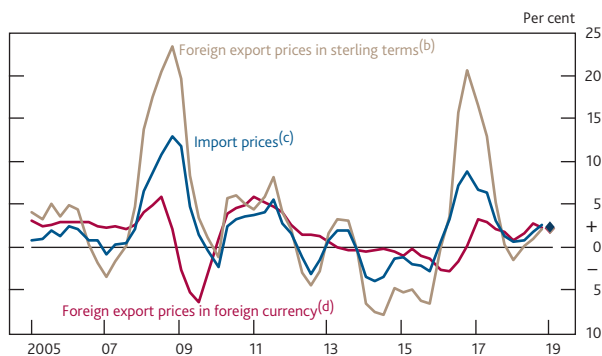
Wholesale gas prices — which feed through into retail prices with a lag — have fallen by around a third since the February Report (Chart 4.3). Wholesale electricity prices have fallen by a similar amount. These wholesale prices represent an important part of retail energy companies' costs and they are a key input to how Ofgem calculates the energy price cap that affects standard variable and pre-payment tariffs. Given the recent fall in wholesale costs, the cap — which is reviewed twice a year — is projected to fall in October, having risen in April, and that will feed into retail gas and electricity prices.

Sterling oil prices — which affect CPI inflation directly through their impact on petrol prices as well as indirectly through their impact on production and transport costs — have been volatile over the recent past, but are currently at a similar level to a year ago (Chart 4.3). The oil futures curve — on which the MPC's forecasts are conditioned — is downward sloping. The projected contribution from fuel prices to CPI inflation further out is therefore a little lower than in February, when the futures curve was broadly flat.

Overall, the contribution of retail energy prices to CPI inflation is expected to fall in 2019, dragging on inflation by 0.2 percentage points in 2019 Q4.

Chart 4.4 Import price inflation fell back in 2017, but has been rising since

Import price and foreign export price inflation^(a)



Sources: Bank of England, CEIC, Eikon from Refinitiv, Eurostat, ONS and Bank calculations.

- (a) The diamonds show Bank staff's projections for 2019 Q1.
- (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 prices

Higher import prices caused by sterling's referendum-related depreciation (Chart 4.4) have pushed up CPI inflation in recent years. Pass-through of that depreciation to CPI inflation appears to have been broadly in line with the MPC's assumptions so far, although there is uncertainty about its precise extent and timing. For example, it is possible that pass-through occurred faster than had been anticipated, but then also fell back more quickly, such that import prices are now pushing up CPI inflation by less than currently estimated.

Annual import price inflation rose to 2.6% in 2018 Q4 (Chart 4.4), higher than expected in the February 2019 forecast. Import price inflation is projected to turn negative in 2019 Q4, however, partly reflecting the 1½% appreciation of sterling since February. The effect of import prices on CPI inflation is consequently expected to diminish, both in 2019 and further out (Section 5).

The outlook for inflation will continue to be sensitive to movements in the exchange rate. The sterling ERI has been volatile recently and has been sensitive to news related to Brexit (Section 1). Box 5 of the February 2019 Report sets out how the projections for growth and inflation could be sensitive to different exchange rate paths.

Table 4.A Monitoring the MPC's key judgements

Developments anticipated in February during 2019 Q1–2019 Q3	Developments now anticipated during 2019 Q2–2019 Q4
Household energy prices	Revised down
<ul style="list-style-type: none"> Electricity and gas prices to contribute around ¼ percentage point to CPI inflation in 2019 Q2, as Ofgem's energy price cap is raised. 	<ul style="list-style-type: none"> Electricity and gas prices drag on CPI inflation in 2019 Q4, as Ofgem's energy price cap is assumed to be lowered.
Import prices	Revised down
<ul style="list-style-type: none"> Non-fuel import prices to rise by just over ¾% in the year to 2019 Q3. 	<ul style="list-style-type: none"> Non-fuel import prices to fall by just under ¾% in the year to 2019 Q4.
Wage and unit labour costs	Broadly unchanged
<ul style="list-style-type: none"> Four-quarter growth in whole-economy AWE regular pay to average around 3¼%. Four-quarter growth in whole-economy unit labour costs to average around 3¼%. Four-quarter growth in whole-economy unit wage costs to average just over 3%; growth in private sector regular pay based unit wage costs to average around 3¼%. 	<ul style="list-style-type: none"> Four-quarter growth in whole-economy AWE regular pay to average around 3¼%. Four-quarter growth in whole-economy unit labour costs to average around 2¾%. Four-quarter growth in whole-economy unit wage costs to average just under 3%; growth in private sector regular pay based unit wage costs to average around 3¼%.
Inflation expectations	Broadly unchanged
<ul style="list-style-type: none"> Indicators of medium-term inflation expectations to continue to be broadly consistent with the 2% target. 	<ul style="list-style-type: none"> Indicators of medium-term inflation expectations to continue to be broadly consistent with the 2% target.

Table 4.B Pay growth has strengthened over the past year

Indicators of pay growth

	2002–07 ^(a)	2010–17 ^(a)	2018				2019 Q1
			Q1	Q2	Q3	Q4	
Average weekly earnings growth (per cent)^(b)							
Whole-economy total pay	4.2	1.9	2.6	2.4	3.1	3.5	3.5
Private sector total pay	4.2	2.0	2.8	2.3	3.2	3.7	3.7
Whole-economy regular pay ^(c)	3.9	1.8	2.9	2.7	3.2	3.4	3.3
Private sector regular pay ^(c)	3.8	1.9	3.0	2.8	3.3	3.5	3.6
Survey indicators of pay growth							
CBI ^(d)	n.a.	1.9	2.6	2.4	2.5	2.6	2.9
Agents ^(e)	2.4	1.6	2.1	2.3	2.5	2.5	2.5
CIPD ^(f)	n.a.	1.6	2.0	2.0	2.0	2.0	n.a.
Survey indicators of pay growth for new recruits							
REC ^(g)	56.7	56.7	61.0	61.8	62.2	63.1	61.1

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

(a) Quarterly averages.

(b) Three-month average growth on the same period a year earlier. Figures for 2019 Q1 are Bank staff's projections, based on data to February.

(c) Total pay excluding bonuses and arrears of pay.

(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 only available since 2009 Q1, and other sectors since 2008 Q2.

(e) Quarterly averages for manufacturing and services weighted together using employee job shares. The scores refer to companies' labour costs over the past three months compared with the same period a year earlier. Scores of -5 and 5 represent rapidly falling and rapidly rising costs respectively, with zero representing no change.

(f) Pay increase intentions excluding bonuses over the coming year. Data only available since 2012.

(g) Quarterly averages for the pay of permanent and temporary new placements weighted together using LFS employee job shares. A reading above 50 indicates growth on the previous month and below 50 indicates a decrease.

4.3 Domestic cost pressures

Developments in labour costs

Wage growth picked up during 2018. Four-quarter growth in whole-economy total pay is expected to have remained at 3.5% in 2019 Q1, some way above its post-crisis average of 1.9% (Table 4.B). Annual growth in regular pay — which excludes the volatile bonus component from total pay — is expected to have been similar. According to the Bank's database, median pay settlements were around 3% over the year to March, similar to at the time of the February Report. April is an important month for settlements, however, and much of those data are still to come.

Pay is growing at its strongest sustained pace since 2008. Previous episodes where wage growth has picked up since the financial crisis have proved to be transitory. In mid-2015, for example, pay growth rose to 3.1%, but fell back to 1.9% by the end of the year. Part of the pickup in pay growth during 2018 reflects compositional effects, which will probably unwind at some stage. But the main driver has been the tightness in the labour market, which is likely to persist (Section 3).

Survey data point to continued solid wage growth in the near term. Expected pay growth picked up in 2019 Q1 in the CBI surveys. According to the REC survey, pay growth for new recruits fell back slightly in 2019 Q1, but the survey still suggests that wage growth will stay close to current rates. Intelligence from the Bank's Agents suggests that wage growth was robust but levelling off. The Agents' contacts reported that companies with a high proportion of low-paid staff concentrated pay increases on employees who were on or just above the National Living Wage, which rose to £8.21 in April.

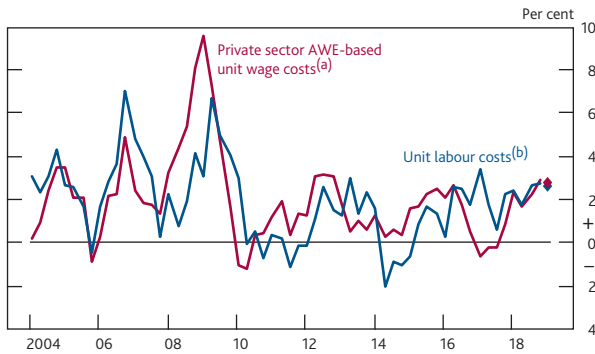
The extent to which the cost of labour affects companies' production costs per unit of output depends on how it is growing relative to productivity. Unit labour costs (ULCs) can be volatile, but they have accelerated in recent quarters and grew by 2.8% in the year to 2018 Q4, as wage growth has strengthened and productivity growth has weakened (Chart 4.5). Monthly data suggest that ULC growth fell back slightly to 2.6% in 2019 Q1. Growth in private sector unit wage costs based on the AWE measure of pay was similar. These rates are above historical averages.

In the MPC's central projection, unit labour cost growth is expected to remain robust and to contribute to a gradual building of domestic inflationary pressures (Section 5).

Other measures of domestically generated inflation

Non-wage indicators of domestically generated inflation (DGI) have generally been stable in recent quarters (Chart 4.6), but remain weak relative to ULC growth. In particular, core services CPI inflation remains some way below its pre-crisis

Chart 4.5 Unit labour cost growth has picked up
Four-quarter unit labour and unit wage cost growth

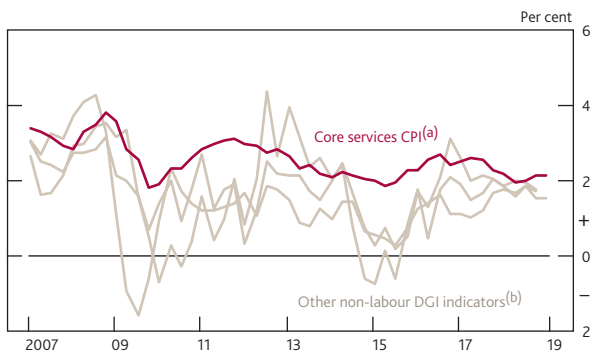


Sources: ONS and Bank calculations.

- (a) Private sector wage costs divided by private sector output, based on the backcast of the final estimate of private sector output. The diamond shows Bank staff's projection for 2019 Q1.
- (b) 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 2019 Q1.

Chart 4.6 Core services CPI inflation remains subdued relative to the past decade

Indicators of domestically generated inflation

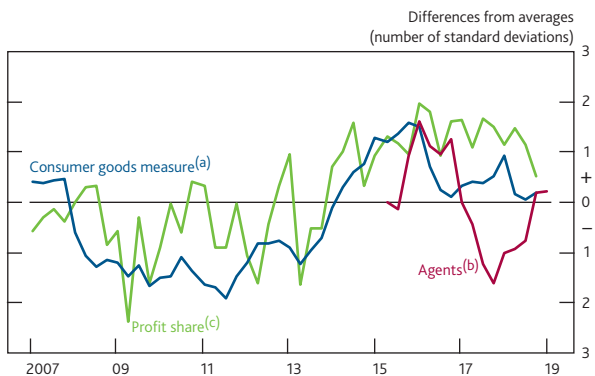


Sources: ONS and Bank calculations.

- (a) Quarterly averages of monthly data. 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.
- (b) Includes the GDP deflator (to 2018 Q4), GVA deflator excluding the government sector (to 2018 Q4) and services PPI (to 2019 Q1).

Chart 4.7 Some indicators suggest that margins have fallen in recent years

Indicators of companies' margins



Sources: ONS and Bank calculations.

- (a) Calculated as differences in the ratio of the CPI, seasonally adjusted by Bank staff, and estimated costs of production and distribution for consumer goods and services, consisting of labour, imports, energy and taxes, weighted to reflect their intensity in CPI. Difference from average since 2000.
- (b) Quarterly averages of scores for margins in the manufacturing and services sectors weighted together using output shares.
- (c) Private non-financial corporations' gross trading profits as a share of GVA at factor cost. Difference from average since 2000.

average of around 3½%. This is an important measure because it focuses on a subset of the CPI basket which is largely domestically produced, as well as excluding some volatile components such as food and energy prices. Core services CPI inflation has been depressed by particular weakness in a small number of components, notably rents and insurance, but nonetheless continues to paint a relatively muted picture of domestic inflationary pressures.

The weakness of core services CPI could be linked to the same factors that caused the sterling depreciation around the time of the referendum. The depreciation may have partly reflected a judgement by financial markets that UK businesses selling tradable goods and services would be less competitive in future. That would be expected to raise the price of tradable goods and services relative to non-tradable ones. Some of that adjustment could have happened through lower inflation among the non-tradable components included in core services CPI, as well as through higher inflation among tradable components that are not.⁽¹⁾

The pickup in the growth rate of labour and other production costs and the fall in CPI inflation might suggest that companies' margins in the consumer goods and services sectors have been squeezed. Margins are difficult to measure, but Bank staff's indicator of profit margins among companies producing consumer goods has fallen back from its late-2015 high (Chart 4.7). The profit share — another proxy for companies' margins — has also fallen slightly in recent years. The Bank's Agents' score for profit margins fell in 2017, although this has since partially reversed to around its series average.

4.4 Inflation expectations

The MPC monitors a range of indicators of inflation expectations — derived from financial market prices and surveys of households and companies — to assess whether they remain consistent with the target.

Inflation expectations among households, companies and professional forecasters have given mixed signals recently. Household inflation expectations were little changed in the latest quarter, although there has been some upward drift in the short-term measures over the past year. Companies' inflation expectations fell in the latest data, although these have been somewhat volatile in the past. The medium-term projections of professional forecasters fell slightly to 1.8% in 2019 Q2 (Table 4.C).

(1) For more details, see Tenreyro, S (2019), 'The elusive supply potential: monetary policy in times of uncertainty'.

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

Per cent	2000– 07 ^(b)	2010– 17	2018				2019	
			Q1	Q2	Q3	Q4	Q1	Q2 ^(c)
One year ahead inflation expectations								
Households^(d)								
Bank/GfK/TNS ^(e)	2.4	3.0	2.9	2.9	3.0	3.2	3.2	n.a.
Barclays Basix	2.8	2.6	2.5	2.4	2.5	2.6	n.a.	n.a.
YouGov/Citigroup	2.5	2.4	2.4	2.5	2.7	2.7	2.7	2.7
Companies^(f)	n.a.	1.6	3.7	2.3	2.4	2.0	1.0	n.a.
Financial markets^(g)	2.6	2.9	3.0	3.1	3.2	3.4	3.4	3.3
Two to three year ahead expectations								
Households^(d)								
Bank/GfK/TNS ^(e)	n.a.	2.8	2.9	2.9	2.9	2.8	2.9	n.a.
Barclays Basix	3.2	3.0	3.0	2.9	3.0	3.0	n.a.	n.a.
Companies^(f)	n.a.	n.a.	3.7	2.5	2.4	1.9	1.4	n.a.
Professional forecasters^(h)	2.0	2.1	2.0	1.9	2.0	1.8	2.0	1.8
Financial markets^(g)	2.8	3.0	3.3	3.3	3.4	3.6	3.5	3.6
Five to ten year ahead expectations								
Households^(d)								
Bank/GfK/TNS ^(e)	n.a.	3.2	3.4	3.6	3.6	3.5	3.4	n.a.
Barclays Basix	n.a.	3.7	4.1	4.0	3.9	4.1	n.a.	n.a.
YouGov/Citigroup	3.5	3.2	3.1	3.2	3.3	3.2	3.1	3.2
Financial markets^(g)	3.0	3.3	3.4	3.4	3.4	3.5	3.5	3.6
Memo: CPI inflation	1.6	2.3	2.7	2.4	2.5	2.3	1.9	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) Averages from 2000, or start of series, to 2007. Financial markets data start in October 2004, YouGov/Citigroup data start in November 2005 and professional forecasters data start in 2006 Q2.

(c) Financial markets data are averages to 24 April 2019. YouGov/Citigroup data are for April.

(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 and the following 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.

Measures of inflation expectations derived from financial market indicators increased in 2018 H2. Financial market inflation expectations at the one-year horizon have fallen back a little since, but longer-term measures have risen a little further (Table 4.C). This is in contrast to inflation expectations in the US and euro area, which have fallen over the past year.

Overall, the MPC judges that inflation expectations remain anchored. The MPC will continue to monitor measures of expectations closely.

5 Prospects for inflation

The MPC expects UK GDP growth to be a little below potential over 2019, reflecting subdued global growth as well as the impact of Brexit uncertainties. The impact of those uncertainties is assumed to subside gradually over the forecast period, consistent with the MPC's conditioning assumption of a smooth withdrawal of the UK from the EU. Demand growth is therefore projected to recover and rises above the subdued rate of potential supply growth. As a result, excess demand builds and domestic inflationary pressures strengthen. CPI inflation is projected to remain somewhat below the MPC's target over much of the first half of the forecast period, largely reflecting lower expected retail energy prices. It then picks up to above the target supported by those strengthening domestic inflationary pressures, and is still rising at the end of the three-year forecast period.

The MPC noted in the *February Report* that UK data could be more than usually volatile in the near term, due to shifting expectations about Brexit in financial markets and among businesses and households. Since then, UK activity appears to have been slightly weaker than expected in 2018 Q4, with the latest ONS estimate of quarterly growth at 0.2%. However, GDP growth is expected to have risen to 0.5% in 2019 Q1 — stronger than projected in February — in part reflecting a boost from companies building up stocks ahead of a potential no-deal Brexit. That boost is expected to be temporary, and quarterly GDP growth is expected to slow to 0.2% in 2019 Q2.

Smoothing through those developments, the underlying pace of UK GDP growth appears to have been slightly stronger than was anticipated in February, but nonetheless marginally below potential. That subdued pace reflects the impact of the slowdown in global growth and Brexit uncertainties. UK GDP growth is projected to remain slightly below trend rates in the second half of this year. The uncertainty around the near-term outlook is judged likely to continue to be higher than usual, however. Given the current elevated Brexit uncertainties, some data over the coming quarters could continue to be volatile, and might provide less of a signal about the underlying path of the economy over the medium term.

As in previous *Reports*, the MPC's projections — which are summarised in **Table 5.A** — are conditioned on a smooth transition to the average of a range of possible outcomes for the United Kingdom's eventual trading relationship with the

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

	Projections			
	2019 Q2	2020 Q2	2021 Q2	2022 Q2
GDP ^(c)	1.6 (1.3)	1.5 (1.5)	2.1 (1.8)	2.2
CPI inflation ^(d)	2.1 (1.9)	1.7 (2.2)	2.1 (2.1)	2.2
LFS unemployment rate	3.8 (4.0)	3.9 (4.1)	3.7 (4.0)	3.5
Excess supply/Excess demand ^(e)	-¼ (-¼)	0 (0)	+½ (+¼)	1
Bank Rate ^(f)	0.7 (0.7)	0.8 (0.9)	0.9 (1.1)	1.0

(a) Modal projections for GDP, CPI inflation, LFS unemployment and excess supply/excess demand. Figures in parentheses show the corresponding projections in the February 2019 *Inflation Report*. Projections were only available to 2022 Q1 in February.

(b) The projections have been conditioned on the Term Funding Scheme and the prevailing prices of a broad range of assets, which embody market expectations of the future stocks of purchased gilts and corporate bonds. The main assumptions are set out in the 'Download the chart slides and data' link at www.bankofengland.co.uk/inflation-report/2019/may-2019.

(c) Four-quarter growth in real GDP. The growth rates reported in the table exclude the backcast for GDP. Including the backcast 2019 Q2 growth is 1.6%, 2020 Q2 growth is 1.5%, 2021 Q2 growth is 2.1% and 2022 Q2 growth is 2.2%. This compares to 1.4% in 2019 Q2, 1.5% in 2020 Q2 and 1.8% in 2021 Q2 in the February 2019 *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.

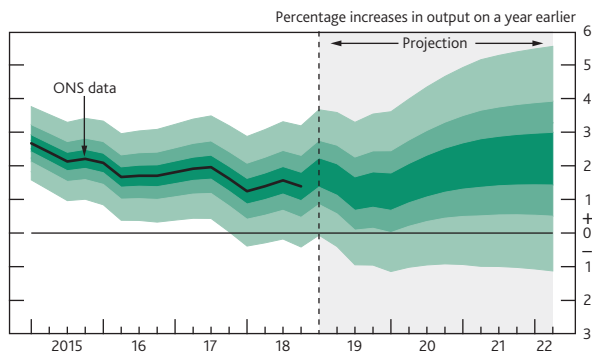
(f) Per cent. The path for Bank Rate implied by forward market interest rates. The curves are based on overnight index swap rates.

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

Per cent	2019			2020				2021				2022	
	Q2 ^(b)	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
May	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0
February	0.7	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1

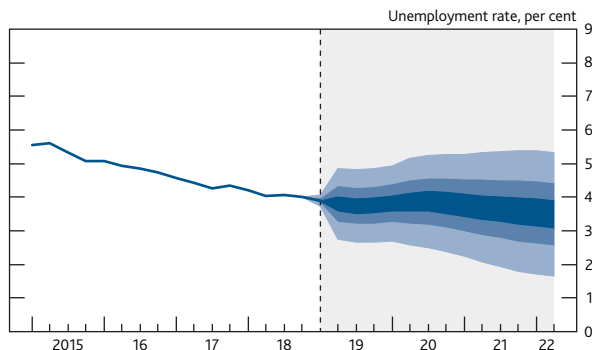
(a) The data are 15 working day averages of one-day forward rates to 24 April 2019 and 30 January 2019 respectively. The curve is based on overnight index swap rates.
 (b) May figure for 2019 Q2 is an average of realised overnight rates to 24 April 2019, and forward rates thereafter.

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 from the 'Download the chart slides and data' link at www.bankofengland.co.uk/inflation-report/2019/may-2019. 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 outcomes are also expected to lie within each pair of the lighter green areas on 30 occasions. In any particular quarter of the forecast period, GDP growth is therefore expected to lie somewhere within the fan on 90 out of 100 occasions. And on the remaining 10 out of 100 occasions GDP growth can fall anywhere outside the green area of the fan chart. Over the forecast period, this has been depicted by the light grey background. See the box on page 39 of the November 2007 *Inflation Report* for a fuller description of the fan chart and what it represents.

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 2019 Q1, a quarter earlier than the fan for CPI inflation. That is because Q1 is a staff projection for the unemployment rate, based in part on data for January and February. The unemployment rate was 3.9% in the three months to February, and is projected to be 3.9% in Q1 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.

European Union.⁽¹⁾ Consistent with that conditioning assumption, Brexit uncertainties are assumed to wane gradually over the forecast period.

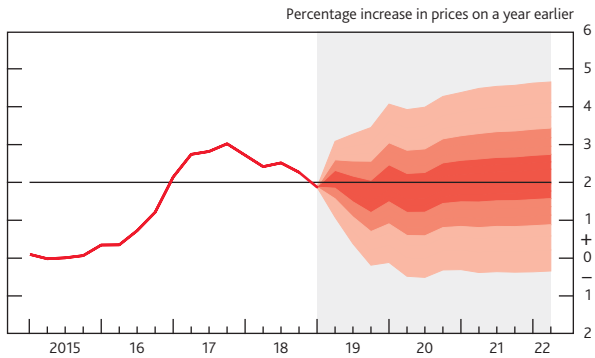
The MPC's projections are also conditioned on a range of UK asset prices. Over the past few months, expectations of policy rates in the US and euro area have fallen significantly (Section 1). Market expectations for the path of Bank Rate have followed these downwards. That path currently implies that Bank Rate rises to around 1% by the end of the forecast period (Table 5.B), around 15 basis points lower than in the February 2019 Report. Lower expectations for the path of interest rates in a number of countries have supported risky asset prices: global equity prices have risen and global corporate bond spreads have narrowed. Those developments are projected to support world and UK GDP growth. In contrast, the recent slight appreciation of the sterling exchange rate — which has risen by 1½% over the past three months — will dampen UK growth and inflation a little relative to February. Sterling's appreciation appears to reflect financial market participants reducing the probability they place on a no-deal Brexit.

Under those assumptions, four-quarter UK GDP growth is projected to decline in the near term (Chart 5.1). That slowing partly reflects the continued effect of uncertainties around the eventual nature of the UK's withdrawal from the EU. Uncertainty has had a particularly pronounced impact on business investment, which fell in every quarter in 2018 and is projected to decline further over coming quarters. The slowdown in world GDP growth over the past year or so has also weighed on UK activity, and net trade is projected to continue to dampen four-quarter UK growth in the near term as a result. In contrast, household spending is expected to continue to support demand growth, sustained by further growth in employment and wages. In 2020, four-quarter GDP growth begins to pick up, and it rises to over 2% by the end of the forecast period. The pickup is driven in part by some recovery in investment growth (Key Judgement 2), and is supported by a projected stabilisation in global growth (Key Judgement 1), as well as continuing increases in household consumption and government spending. Growth on average is a little higher than in the February Report (Table 5.C), partly reflecting the boost to demand from the lower yield curve and higher risky asset prices.

Following its annual reassessment of supply-side conditions in February, the MPC judged that potential supply growth would

(1) Unless otherwise stated, the projections shown in this section are conditioned on: Bank Rate following a path implied by market yields; the Term Funding Scheme; 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 2019; commodity prices following market paths; the sterling exchange rate remaining broadly flat; and the prevailing prices of a broad range of other assets. The asset prices that the forecast is conditioned on embody market expectations of the future stocks of purchased gilts and corporate bonds. The main assumptions are set out in the 'Download the chart slides and data' link at www.bankofengland.co.uk/inflation-report/2019/may-2019.

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



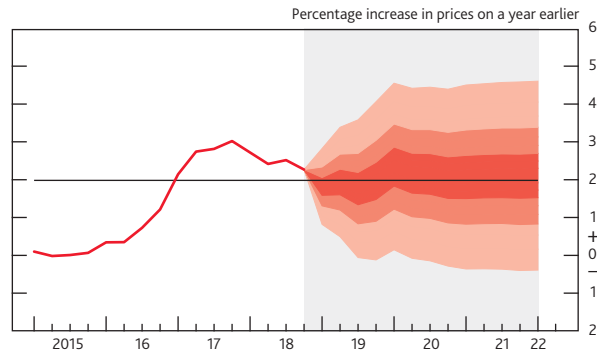
Charts 5.3 and 5.4 depict the probability of various outcomes for CPI inflation in the future. They have been conditioned on the assumptions in Table 5.A footnote (b). If economic circumstances identical to today's were to prevail on 100 occasions, the MPC's best collective judgement is that inflation 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.

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

	Mode	Median	Mean
2019	1.5 (1.2)	1.5 (1.2)	1.5 (1.2)
2020	1.6 (1.5)	1.6 (1.5)	1.6 (1.5)
2021	2.1 (1.9)	2.1 (1.9)	2.1 (1.9)

(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 February 2019 *Inflation Report* excluding the backcast. The projections have been conditioned on the assumptions in Table 5.A footnote (b).

Chart 5.4 CPI inflation projection in February based on market interest rate expectations, other policy measures as announced



remain subdued relative to pre-crisis norms over the forecast period. The MPC judges that there is currently a small margin of excess supply. As GDP growth picks up in 2020, it rises above the subdued pace of potential supply growth, such that excess demand begins to build (Key Judgement 3). Excess demand rises to slightly above 1% of potential GDP by the end of the forecast period, notably higher than in February, with the unemployment rate projected to decline to 3½% (Chart 5.2).

CPI inflation was slightly below the MPC's 2% target in 2019 Q1. It is projected to fall further below the target over the first half of the forecast period, and to a greater extent than was expected in February, largely reflecting lower expected retail energy prices. Further ahead, building excess demand leads to firmer domestic inflationary pressures (Key Judgement 4). CPI inflation picks up to above the target (Chart 5.3), and is still rising at the end of the three-year forecast period. Inflation is a little higher than the February projection at that horizon (Chart 5.4).

At its meeting ending on 1 May 2019, the MPC voted to maintain Bank Rate at 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 pages i–ii 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.

(2) The Minutes are available at www.bankofengland.co.uk/monetary-policy-summary-and-minutes/2019/may-2019.

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 2019 Q2 to 2019 Q4 if judgements evolve as expected
1: global GDP growth settles at around its potential rate	<ul style="list-style-type: none"> • Quarterly euro-area GDP growth to average a little above ¼%. • Quarterly US GDP growth to average ½%. • Indicators of activity consistent with four-quarter PPP-weighted emerging market economy growth of around 4¼%; within that, GDP growth in China to average around 6%. • Net trade to provide a small positive contribution to quarterly UK GDP growth.
2: UK domestic demand growth is soft in the near term, partly reflecting the impact of elevated Brexit uncertainties, before recovering	<ul style="list-style-type: none"> • Business investment to fall by ¼% per quarter, on average. • Quarterly real post-tax household income growth to average just over ¼%. • Quarterly consumption growth to be between ¼% to ½%. • Mortgage spreads to widen a little. • Mortgage approvals for house purchase to average just over 60,000 per month. • The UK house price index to fall by just over 1¼% in the year to 2019 Q4. • Housing investment to fall by ½% per quarter, on average.
3: as GDP growth recovers to above the subdued rate of potential supply growth, excess demand builds	<ul style="list-style-type: none"> • Unemployment rate to average 3¾%. • Participation rate to remain around 64%. • Average weekly hours worked to remain around 32. • Quarterly hourly labour productivity growth to average ¼%.
4: CPI inflation dips further below 2% during the first half of the forecast period, largely reflecting lower energy prices, but domestic inflationary pressures push inflation above the target further out	<ul style="list-style-type: none"> • Non-fuel import prices to fall by just under ¾% in the year to 2019 Q4. • Electricity and gas prices to move in line with Ofgem's energy price cap. The contribution of retail energy — gas, electricity and fuels — to CPI inflation to fall from around ¼ percentage point in 2019 Q2 to around -¼ percentage point in Q4. • Commodity prices and sterling ERI to evolve in line with the conditioning assumptions set out in this <i>Report</i>. • Four-quarter growth in whole-economy AWE regular pay to average around 3¼%. • Four-quarter growth in whole-economy unit labour costs to average around 2¾%. • Four-quarter growth in whole-economy unit wage costs to average just under 3%; growth in private sector regular pay based unit wage costs to average around 3¼%. • Indicators of medium-term inflation expectations to continue to be broadly consistent with the 2% target.

5.1 The MPC's key judgements and risks

Key Judgement 1: global GDP growth settles at around its potential rate

Four-quarter global GDP growth has slowed since 2017, to below its potential rate. That slowing has been broad-based, with growth declining in advanced and emerging economies (Section 1).

The slowing in global growth partly reflects a drag from financial conditions. Financial conditions tightened over 2018, in part due to the withdrawal of some monetary stimulus by the US Federal Reserve, which led to falls in risky asset prices in many emerging economies. In addition, trade tensions between the US and China have weighed on global growth. Growth in China has also weakened in response to past domestic policy tightening.

Table 5.E MPC key judgements^{(a)(b)}

	Average 1998– 2007	Projections		
		2019	2020	2021
World GDP (UK-weighted) ^(c)	3	2 (2)	2¼ (2)	2¼ (2)
World GDP (PPP-weighted) ^(d)	4	3¼ (3¼)	3½ (3¼)	3½ (3½)
Euro-area GDP ^(e)	2¼	1¼ (1)	1½ (1½)	1¾ (1½)
US GDP ^(f)	3	2¼ (2¼)	1¾ (1¾)	1¾ (1¾)
Net trade contribution to UK GDP growth ^(g)	-¼	-¼ (-½)	½ (0)	0 (0)

Key Judgement 2: UK domestic demand growth is soft in the near term, partly reflecting the impact of elevated Brexit uncertainties, before recovering

	Average 1998– 2007	Projections		
		2019	2020	2021
Business investment contribution to GDP growth ^(h)	¼	-¼ (-¼)	¼ (¼)	½ (½)
Business investment to GDP ratio ⁽ⁱ⁾	9¾	9 (9)	9 (9)	9¼ (9¼)
Household consumption contribution to GDP growth ^(j)	2¼	1 (1)	1 (¾)	1¼ (1)
Credit spreads ^(k)	¾ (l)	1½ (1½)	1½ (1½)	1¾ (1½)
Household saving ratio ^(m)	8½	4½ (4¾)	4 (4½)	4¼ (4½)

Key Judgement 3: as GDP growth recovers to above the subdued rate of potential supply growth, excess demand builds

	Average 1998– 2007	Projections		
		2019	2020	2021
Productivity ⁽ⁿ⁾	2¼	0 (¼)	1 (1)	1 (1)
Participation rate ^(o)	63	64 (63¾)	64 (63¾)	64 (63¾)
Average hours ^(p)	32¼	32 (32)	32¼ (32¼)	32¼ (32¼)

Key Judgement 4: CPI inflation dips further below 2% during the first half of the forecast period, largely reflecting lower energy prices, but domestic inflationary pressures push inflation above the target further out

	Average 1998– 2007	Projections		
		2019	2020	2021
UK import prices ^(q)	¼	-½ (-¼)	0 (½)	0 (¼)
Dollar oil prices ^(r)	39	70 (61)	66 (61)	64 (61)
Unit labour costs ^(s)	2¾	2¾ (2½)	2 (2)	2½ (2½)
Unit wage costs ^(t)	2½	2¾ (2¼)	2 (2)	2½ (2½)
Private sector regular pay based unit wage costs ^(u)	1¾	3 (3)	2¼ (2¼)	2½ (2½)

Sources: Bank of England, BDCR 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 February 2019 *Inflation Report*. Calculations for back data based on ONS data are shown using ONS series identifiers.
- (c) Chained-volume measure. Constructed using real GDP growth rates of 180 countries weighted according to their shares in UK exports.
- (d) Chained-volume measure. Constructed using real GDP growth rates of 181 countries weighted according to their shares in world GDP using the IMF's purchasing power parity (PPP) weights.
- (e) Chained-volume measure. Forecast was finalised before the release of the preliminary flash estimate of euro-area GDP for Q1, so that has not been incorporated.
- (f) Chained-volume measure. Forecast was finalised before the release of the advance estimate of US GDP for Q1, so that has not been incorporated.
- (g) Chained-volume measure. Exports less imports.
- (h) Chained-volume measure.
- (i) Chained-volume business investment as a percentage of GDP.
- (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 inflation rate in Q4 excluding fuel and the impact of MTIC fraud.
- (r) Average level in Q4. Dollars per barrel. Projection based on monthly Brent futures prices.
- (s) Four-quarter growth in unit labour costs in Q4. Whole-economy total labour costs divided by GDP at constant 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.
- (t) Four-quarter growth in whole-economy unit wage costs in Q4. Whole-economy wage costs divided by GDP at constant prices, based on the mode of the MPC's GDP backcast. Total wage costs are wages and salaries excluding non-wage costs and the labour share multiplied by mixed income.
- (u) Four-quarter growth in private sector regular pay based unit wage costs in Q4. Private sector wage costs divided by private sector output at constant prices, based on the mode of the MPC's GDP backcast. Private sector wage costs are average weekly earnings (excluding bonuses) multiplied by private sector employment.

Since the end of 2018, global financial conditions have eased as expectations for the paths of monetary policy in a number of major economies have fallen and risky asset prices have risen. In addition, trade tensions between the US and China appear to have lessened somewhat. Those developments should support world growth. Quarterly global GDP growth is projected to be relatively stable at rates close to potential over the forecast period, such that four-quarter growth picks up a little over the near term and settles around potential rates.

Taken together, global growth — based on PPP weights — is projected to slow from 3¾% in 2018 to 3¼% in 2019, before picking up a little to 3½% in 2020 and 2021 (Table 5.E). Weighted by UK export shares, growth is expected to slow from 2½% in 2018 to 2% in 2019, before recovering slightly to 2¼% in both 2020 and 2021 (Chart 5.5). Those projections are a little higher than three months ago, partly reflecting the easing in financial conditions since then. The MPC judges that the risks around the projections remain broadly balanced, partly reflecting two-sided risks from trade tensions.

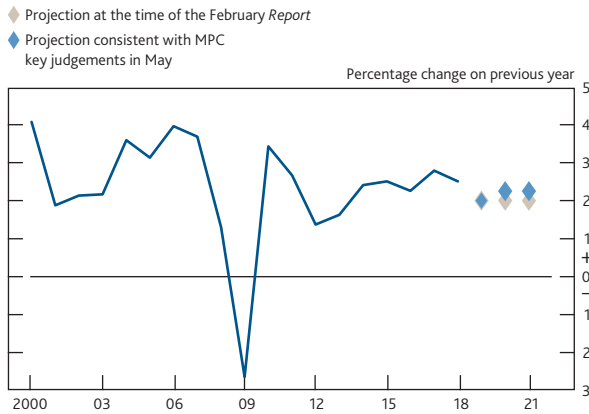
The slowdown in global growth over the past has weighed on UK GDP growth through trade channels, but that effect is projected to fade as global growth stabilises. Net trade dragged on UK growth over 2018. It is projected to continue to do so in 2019 Q1, partly reflecting the boost to imports from Brexit-related stockbuilding. As that effect fades, and world GDP growth stabilises at around its potential rate, net trade is projected to pick up, although it continues to weigh on four-quarter growth in the near term. Further out, it makes a broadly neutral contribution to UK GDP growth, similar to the February Report.

The global easing in financial conditions has been reflected in UK asset prices. As in other advanced economies, the expected path for policy rates in the UK is lower than in the February Report. UK equity prices are higher than they were three months ago, and corporate bond spreads are narrower. Taken together, those developments boost UK domestic demand relative to the February forecast through their impact on the financial conditions facing companies and households.

Key Judgement 2: UK domestic demand growth is soft in the near term, partly reflecting the impact of elevated Brexit uncertainties, before recovering

While quarterly UK GDP growth is expected to have picked up to 0.5% in 2019 Q1, the MPC judges that underlying momentum is marginally below potential at present. Growth in Q1 appears to have been lifted by erratic monthly movements in output (Section 2) as well as a greater-than-expected contribution from stockbuilding. Companies — particularly manufacturers — appear to have built up their levels of stocks substantially in the first quarter as they implemented contingency plans ahead of a potential no-deal Brexit. Much of this activity will reflect businesses

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



Sources: IMF WEO and Bank calculations.

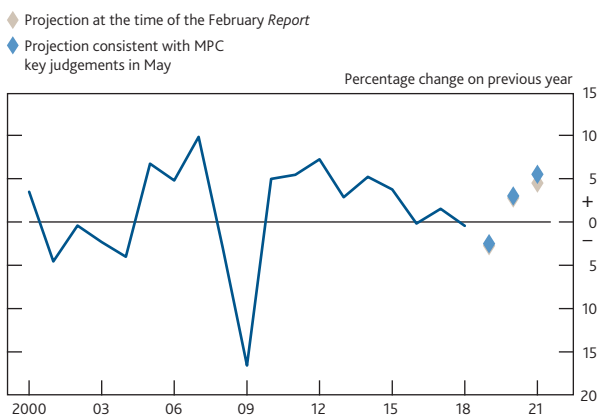
(a) Annual average growth rates. Chained-volume measure. Constructed using real GDP growth rates of 180 countries weighted according to their shares in UK exports.

building up stocks of goods sourced from the EU, and so will be reflected in higher imports. However, monthly survey and official data suggest that inventories have been built up to a greater extent than expected, and that some reflects domestic output including for export to companies on the continent (Box 3). The boost to growth will be temporary, however, and is expected to unwind in Q2 as companies stop building up their inventory levels. Consequently, quarterly GDP growth is expected to slow to 0.2% in 2019 Q2. Looking through the volatility in growth, GDP appears to have been slightly stronger than anticipated in February. Nevertheless, underlying growth is expected to have been slightly below potential and it is projected to remain soft in the second half of the year.

The soft recent pace of underlying UK GDP growth reflects the impact of subdued global growth (Key Judgement 1), as well as the impact of Brexit uncertainties, which have weighed on investment spending in particular. Business investment has been unusually weak since the referendum, and that weakness has intensified over the past year. Surveys, including the Bank’s Decision Maker Panel, suggest that the importance of Brexit as a source of uncertainty has remained elevated in recent quarters, while its impact on investment appears to have increased (Section 2). That might be because the value of deferring investment spending rose in the immediate run-up to the expected end-March EU exit date.

The housing market has also softened in recent quarters. Brexit uncertainties may have played some role in that too, though other factors, including policy changes, increased housing supply and affordability constraints have probably also played a part (Box 4). The softer housing market may have dampened GDP growth to a degree. Housing investment growth has weakened in recent quarters, following a number of years of strong growth driven by robust rates of private house building. Nevertheless, household consumption spending and individuals’ confidence about their own personal financial situation appear to have been relatively unaffected.

Chart 5.6 Business investment^(a)



Sources: ONS and Bank calculations.

(a) Annual average growth rates. Chained-volume measure. Business investment data based on GAN8. Investment data take account of the transfer of nuclear reactors from the public corporation sector to central government in 2005 Q2.

In the near term, Brexit uncertainties are assumed to remain elevated. They subside gradually over the second half of the forecast period, consistent with the MPC’s conditioning assumption of a smooth transition to the new trading relationship between the UK and EU.

As Brexit uncertainties dissipate, business investment picks up (Chart 5.6). Growth is also buoyed by otherwise supportive conditions, such as the lower cost of finance, which boosts growth by a little more than in February. Housing market activity and price inflation are also expected to pick up, as is housing investment growth.

Consumption growth has been underpinned by real income growth over 2018, given solid employment and wage growth.

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

	Average 1998– 2007	Projections		
		2019	2020	2021
Annual average growth rate				
Household consumption ^(b)	3½	1½ (1¼)	1½ (1)	1¾ (1½)
Business investment ^(c)	2½	-2½ (-2¾)	3 (2¾)	5½ (4½)
Housing investment ^(d)	3¼	-2 (-½)	-¾ (¼)	2¾ (2)
Exports ^(e)	4½	3¼ (1)	1¼ (1¼)	1¼ (1¼)
Imports ^(e)	6	4¼ (2½)	0 (1)	1¼ (1¼)
Real post-tax household income ^(f)	3¼	1½ (1¾)	1 (¾)	2 (1¾)
Four-quarter growth rate in Q4				
Employment	1	¾ (¼)	½ (½)	¾ (¾)
Average weekly earnings ^(g)	4¼	3 (3)	3½ (3¼)	3¾ (3¾)

(a) These projections are produced by Bank staff for the MPC to be consistent with the MPC's modal projections for GDP growth, CPI inflation and unemployment. Figures in parentheses show the corresponding projections in the February 2019 *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 continues to support GDP growth throughout the forecast, and to a greater extent than in February (Table 5.F). GDP growth is also supported by government spending.

Taken together, the path for UK demand growth is a little stronger than in February. Four-quarter UK GDP growth slows in the near term, before rising to over 2% by the end of the forecast period. The MPC judges that the risks around this projection are balanced. On the upside, the apparent strength of GDP growth in Q1 could reflect a greater degree of underlying momentum, which could persist in the near term. On the downside, Brexit uncertainties could weigh on spending to a greater extent over coming quarters.

In general, the outlook for demand will depend significantly on how households, companies and financial markets respond to developments in the process of the UK's withdrawal from the EU (see Box 5 in the *February 2019 Report*). Changes in people's expectations about Brexit are likely to continue to affect economic data in the coming months given current elevated uncertainties. That means that incoming data might continue to be volatile and provide less of a signal about the underlying path of the economy over the medium term. As a result, the near-term outlook remains more uncertain than usual.

Key Judgement 3: as GDP growth recovers to above the subdued rate of potential supply growth, excess demand builds

The speed at which demand can grow before it puts upward pressure on inflation depends on the degree of slack in the economy and on the growth rate of potential supply. The MPC judges that there is currently a small margin of excess supply.

In the run-up to the *February Report*, the MPC completed a reassessment of UK supply-side conditions, and judged that potential supply would grow at a similar rate to recent years, which is much lower than pre-crisis rates. Labour supply growth is judged likely to be modest over the forecast period, largely driven by population growth. Productivity growth is projected to pick up a little relative to the very weak rates of the past few years, supported by higher investment over the forecast period. The pickup is gradual, though, with four-quarter potential productivity growth projected to reach around 1% by the end of the forecast period.

In the near term, demand growth is slightly below potential, such that excess supply remains over 2019. Further out, however, demand is projected to grow faster than potential supply. As a result, excess demand emerges and builds to slightly over 1% of potential GDP by the end of the forecast period. The unemployment rate falls further over the second half of the forecast period, and labour market tightness increases.

There are risks in both directions around the projections for labour supply growth and productivity growth and they will remain sensitive to developments in the timing and nature of the UK’s withdrawal from the EU.

Key Judgement 4: CPI inflation dips further below 2% during the first half of the forecast period, largely reflecting lower energy prices, but domestic inflationary pressures push inflation above the target further out

In 2019 Q1, CPI inflation fell to 1.9%, a little above the rate expected in the February *Report*. Energy price inflation was somewhat higher than expected reflecting higher sterling oil prices, partly offset by slightly lower-than-expected contributions from other CPI components.

During the first half of the forecast period, CPI inflation is expected to fall slightly further below the target and is weaker than was projected in February. That largely reflects expected developments in retail energy prices. Wholesale gas and electricity prices have both fallen over the past three months; that is expected to lead to lower utilities prices from 2019 Q4 (Section 4). In addition, while the sterling oil price has risen since the February *Report*, the sterling oil futures curve on which the MPC’s forecasts are conditioned now slopes downward. Taken together, retail energy prices contribute substantially less to CPI inflation on average over the forecast period than they have historically.

Import prices also exert some modest downward pressure on CPI inflation throughout the forecast period relative to February, partly reflecting the appreciation of sterling over the past three months. Imported cost pressures remain elevated, however, reflecting the impact of the referendum-related fall in sterling. Those upward pressures wane over time.

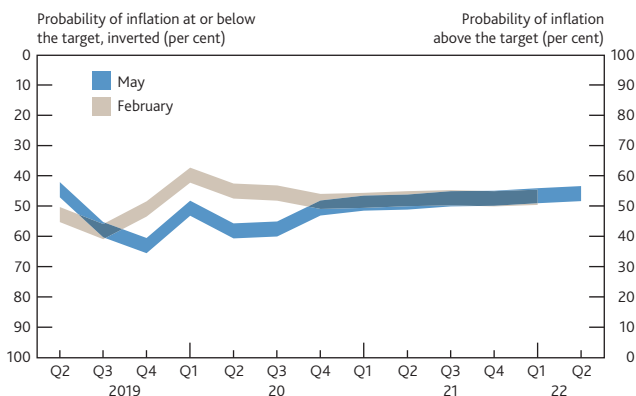
Over the forecast period, the rise in CPI inflation to above the target is driven by increasing upward pressure from domestically generated inflation, supported by building excess demand. Four-quarter wage growth picked up during 2018, reflecting the tightness in the labour market, and is expected to have been 3½% in 2019 Q1. Moreover, given the recent weakness in productivity growth, unit labour cost growth has strengthened to rates which are above historical averages. Consumer prices have not increased as rapidly as might have been expected given the pickup in the growth rates of labour and other production costs, which suggests that companies’ margins in the consumer sector may have been squeezed. That might be due to increased competitive pressures. Alternatively, there could be other factors offsetting the increasing pressure on retail prices from labour costs. For example, if higher import prices from sterling’s past depreciation were passed through more quickly than usual into consumer prices, they could now be exerting less upward pressure on inflation.

Table 5.G Q4 CPI inflation

	Mode	Median	Mean
2019 Q4	1.6 (2.0)	1.6 (2.0)	1.6 (2.0)
2020 Q4	2.0 (2.1)	2.0 (2.1)	2.0 (2.1)
2021 Q4	2.1 (2.1)	2.1 (2.1)	2.1 (2.1)

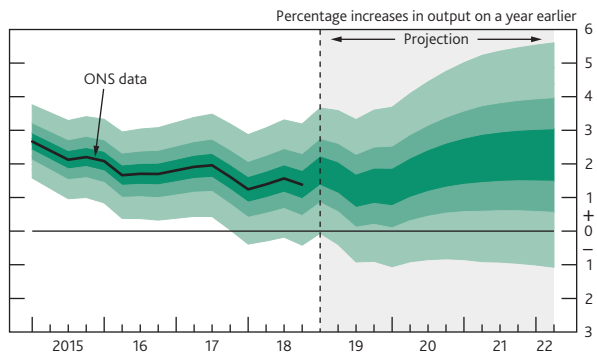
The table shows projections for Q4 four-quarter CPI inflation. The figures in parentheses show the corresponding projections in the February 2019 *Inflation Report*. The projections have been conditioned on the assumptions in Table 5.A footnote (b).

Chart 5.7 Inflation probabilities relative to the target



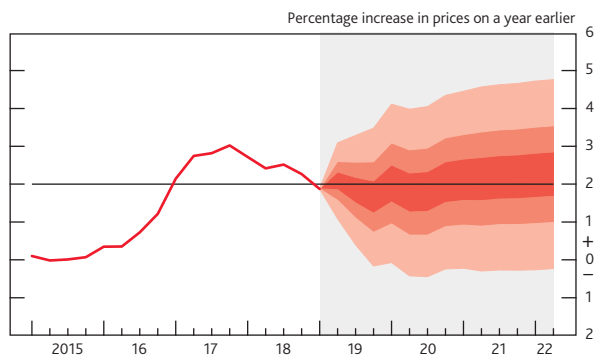
The May and February swatches in this chart are derived from the same distributions as Charts 5.3 and 5.4 respectively. They indicate the assessed probability of inflation relative to the target in each quarter of the forecast period. The 5 percentage points width of the swatches reflects the fact that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

Chart 5.8 GDP projection based on constant nominal interest rates at 0.75%, other policy measures as announced



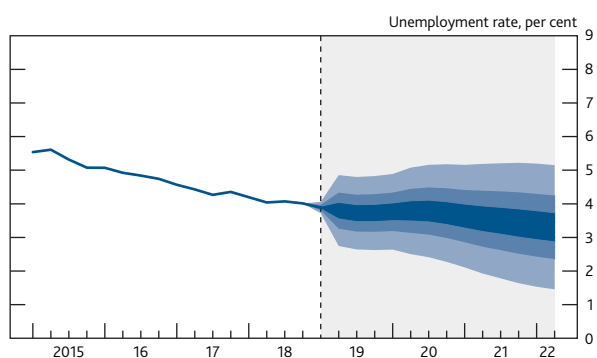
See footnote to Chart 5.1.

Chart 5.9 CPI inflation projection based on constant nominal interest rates at 0.75%, other policy measures as announced



See footnote to Chart 5.3.

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



See footnote to Chart 5.2.

Conditional on market interest rates, CPI inflation is projected to rise over the second and third years of the forecast period (Table 5.G), ending it above the target. Relative to February, inflation is slightly higher and continues to rise at the end of the forecast period, reflecting the greater degree of excess demand. The risks around this projection are judged to be balanced. If the recent increase in unit labour cost growth begins to feed through into retail prices rapidly, CPI inflation could be higher than projected. CPI inflation could be lower if persistent competitive pressures restrain price increases, however.

5.2 The projections for demand, unemployment and inflation

Based on the judgements above and conditioned on the market path for Bank Rate, as well as an assumption of a smooth withdrawal from the EU, the MPC projects four-quarter GDP growth to fall over 2019, before picking up to above 2%. The pickup in demand growth is mainly driven by business investment growth, as the impact of Brexit uncertainties is assumed to wane. The risks around the projection are balanced, as in February.

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. As growth picks up from 2020, excess demand builds and the unemployment rate begins to fall.

CPI inflation has declined, and is projected to be below the MPC’s 2% target over much of 2019, largely reflecting lower energy prices. CPI inflation is then judged likely to pick up to above the target supported by domestic inflationary pressures, and is still rising at the end of the three-year forecast period (Chart 5.7). The risks around the inflation projection remain balanced.

Charts 5.8, 5.9 and 5.10 show the MPC’s projections under the alternative constant rate assumption. 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 slightly stronger. Unemployment falls below 3½%. Inflation ends the forecast period a little further above the target at 2.3%.

Box 6

How has the economy evolved relative to the February 2018 Report?

The MPC regularly assesses how the economy has evolved relative to its forecasts. This box looks at how recent developments in GDP growth, the labour market and inflation compare to the projections in the February 2018 Report (Chart A) and what the MPC has learnt from the evolution of the economy over that period.

The MPC's forecasts use conditioning assumptions for a number of variables, such as the sterling ERI, Bank Rate and US dollar oil prices. As such, when evaluating forecast performance it is important to separate the news introduced by those conditioning assumptions from the MPC's forecast judgements.⁽¹⁾ Over the past year, the news in these conditioning assumptions has been relatively small. The sterling exchange rate was little changed and Bank Rate has evolved broadly in line with developments implied by the yield curve at the time of the February 2018 Report. US dollar oil prices are slightly lower (Table 1).

The February 2018 forecast

In the February 2018 forecast, GDP was projected to grow by 1.8% in the four quarters to 2019 Q1 (Panel 1 of Chart A). GDP growth was expected to be supported by robust growth in the global economy, with net trade providing a positive contribution to GDP growth. Global growth was also expected to support business investment growth, despite ongoing Brexit-related uncertainty. Conversely, household consumption growth was expected to remain relatively subdued, reflecting modest real income growth as a result of the referendum-related sterling depreciation. The rotation of UK GDP growth away from domestic consumption towards investment and net trade that had been observed ahead of the Report was therefore expected to continue.

The MPC judged that the UK economy had only a very limited degree of slack at the time of the February 2018 Report. As part of its regular assessment of potential supply, the MPC lowered its estimate of the long-run equilibrium unemployment rate, from 4½% to 4¼%. Demand growth was expected to outpace the modest rate of supply growth, so that a small margin of excess demand was expected to emerge during the forecast period. Consistent with that, unemployment was expected to fall a little below its equilibrium rate, and then remain broadly flat over the forecast (Panel 2 of Chart A).

CPI inflation was above the 2% target at the time of the February 2018 Report (Panel 3 of Chart A). That was almost entirely due to the effects of higher import prices as a result of

Table 1 Assessing the anticipated developments underpinning the key judgements in the February 2018 Report

Conditioning assumptions and key judgements	Percentage change between latest quarterly data available at the time of the February 2018 and May 2019 Reports, unless otherwise stated ^(a)	
	February 2018 projection	Current estimate
Conditioning assumptions^(b)		
Bank Rate (per cent)	¾	¾
Sterling ERI (index: January 2005 = 100)	79	79
Oil prices (US\$ per barrel)	65	63
Key Judgement 1: the broad-based strength in global growth continues		
World GDP (UK-weighted) ^{(c)(d)}	3¾	2¾
World GDP (PPP-weighted) ^{(c)(e)}	5	4¾
Euro-area GDP ^(c)	3¾	1¾
US GDP ^(c)	3½	3½
China GDP ^(c)	8¾	8¾
Key Judgement 2: the rotation in UK GDP growth away from domestic consumption and towards external demand and investment continues		
Household consumption	1½	2
Business investment	4	-2¾
Exports ^(f)	3¾	¼
Imports ^(f)	1	2
Net trade (contribution to GDP growth) ^(g)	¾	-½
Real post-tax household income	1½	2¾
Household saving ratio (change) ^(h)	0	½
Mortgage spreads (level) ⁽ⁱ⁾	1¾	1
Unsecured credit spreads (level) ⁽ⁱ⁾	11	10¾
Key Judgement 3: very little slack remains and the pace of potential supply growth is modest^(j)		
Productivity ^(k)	1½	-¼
Participation rate (level) ^(l)	63½	64
Average hours (level) ^(m)	32	32¾
Key Judgement 4: with demand outstripping potential supply, domestic inflationary pressures continue to build while the contribution from energy and import prices dissipates		
Non-fuel import prices ^(f)	1	2¾
Whole-economy AWE regular pay ^{(j)(n)}	3½	4
Whole-economy unit labour costs ^{(j)(o)}	2½	3¼

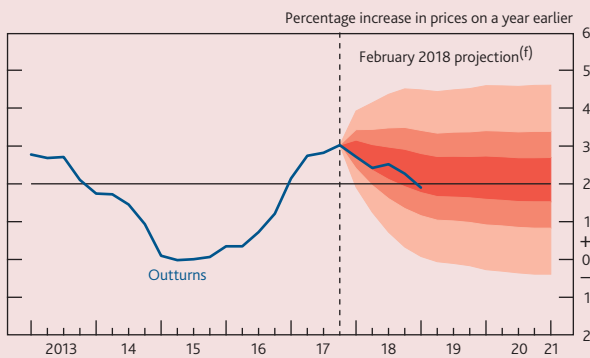
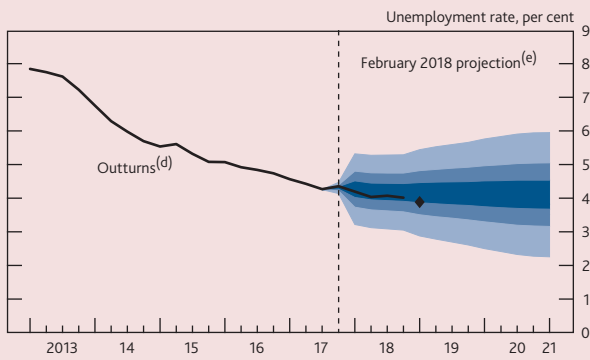
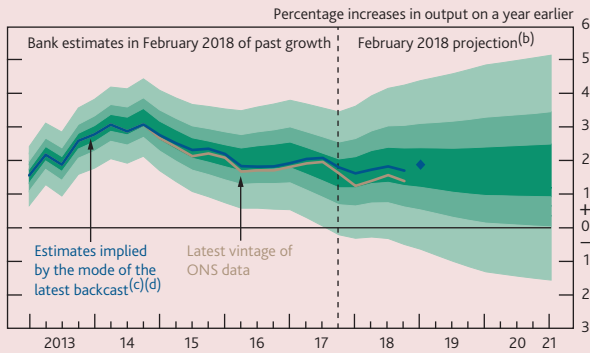
Sources: Bank of England, BDRG Continental *SME Finance Monitor*, Bloomberg Finance L.P., British Household Panel Survey, Department for Business, Energy and Industrial Strategy, Eikon from Refinitiv, Eurostat, ICE/BoAML Global Research (used with permission), IMF *World Economic Outlook (WEO)*, ONS, US Bureau of Economic Analysis and Bank calculations.

- (a) Where partial data are available for the quarter, Bank staff's projection for that quarter, based on those data, is used.
 (b) Level in 2019 Q1.
 (c) Chained-volume measures. Per cent change between 2017 Q3 and 2018 Q4.
 (d) Constructed using real GDP growth rates of 180 countries weighted according to their shares in UK exports.
 (e) 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.
 (f) Excludes the impact of missing trader intra-community fraud. Per cent change between 2017 Q3 and 2018 Q4.
 (g) Percentage point contributions between 2017 Q3 and 2018 Q4. GDP at market prices is based on the mode of the MPC's backcast.
 (h) Percentage of total available household resources. Includes non-profit institutions serving households. Change in percentage points between 2017 Q3 and 2018 Q4.
 (i) Based on the spreads over relevant risk-free rates in 2019 Q1.
 (j) Figure for 2019 Q1 is Bank staff's projection, based on labour market data to February.
 (k) GDP per hour worked. GDP at market prices is based on the mode of the MPC's backcast. Per cent change between 2017 Q4 and 2019 Q1.
 (l) Percentage of the 16+ population.
 (m) Average weekly hours worked in main job and second job.
 (n) Total pay excluding bonuses and arrears of pay. Per cent change between 2017 Q4 and 2019 Q1.
 (o) Whole-economy total labour costs divided by GDP at market prices, based on the mode of the MPC's GDP backcast. Per cent change between 2017 Q4 and 2019 Q1.

(1) For more on the role of conditioning assumptions, see 'Evaluating forecast performance', Independent Evaluation Office, November 2015.

Chart A Forecast errors for GDP growth, unemployment and CPI inflation have all been small relative to the MPC's February 2018 fan charts

GDP, unemployment and CPI inflation outturns and projections in the February 2018 Report^(a)



(a) The projections were conditioned on: market interest rate expectations; the assumption that the stocks of purchased gilts and corporate bonds financed by the issuance of central bank reserves reached £435 billion and £10 billion respectively and remained there throughout the forecast period; and the announced Term Funding Scheme financed by the issuance of central bank reserves.
 (b) See footnote to Chart 5.1 in the February 2018 Report for information on how to interpret the fan chart.
 (c) The latest backcast is a judgement about the path for GDP in the mature estimate of the data.
 (d) The diamond shows Bank staff's projection for 2019 Q1, based on data to February.
 (e) See footnote to Chart 5.2 in the February 2018 Report for information on how to interpret the fan chart.
 (f) See footnote to Charts 5.3 and 5.4 in the February 2018 Report for information on how to interpret the fan chart.

the referendum-related sterling depreciation, though higher oil prices also contributed to the overshoot. Those external forces were expected to slowly dissipate over the forecast, while domestic inflationary pressures were expected to rise. CPI inflation was projected to fall back towards the 2% target during 2018.

News in GDP growth, CPI inflation and the unemployment rate has been relatively small

Compared with the February 2018 forecast, GDP growth, unemployment and CPI inflation have all been within the central bands of the MPC's fan charts (Chart A). These forecast errors are therefore small relative to the uncertainty implied by the fan charts. They are also small relative to past forecast errors.

There has been more news in the composition of demand

Although GDP growth has been in line with the February 2018 projection (Table 2), the expected rotation of GDP growth has not transpired. Business investment and net trade have been much weaker than anticipated, while consumption has been stronger.

Table 2 News since the February 2018 forecast

Per cent, unless otherwise stated	Annual GDP growth: 2019 Q1 ^{(a)(b)}	Unemployment rate: 2019 Q1 ^(b)	Annual CPI inflation: 2019 Q1
Latest outturn	1.9	3.9	1.9
February 2018 forecast	1.8	4.2	2.3
News ^(c)	0.1	-0.3	-0.4

Sources: ONS and Bank calculations.

(a) Chained-volume measure, based on the mode of the MPC's backcast.
 (b) Data for 2019 Q1 are Bank staff projections, based on data to February.
 (c) Percentage points. May not equal the difference between forecast and outturn due to rounding.

Brexit-related uncertainty has weighed on business investment, which fell by just over 2% between 2017 Q3 and 2018 Q4 compared with the 4% growth projected in February 2018 (Table 1). The Bank's latest DMP Survey suggested that investment was significantly lower than would have been the case in the absence of Brexit uncertainties (Section 2).

The slowdown in the global economy has driven weaker-than-expected net trade. UK-weighted world GDP growth was 1 percentage point lower than expected, with downside news in those economies with which the UK does more trade such as the euro area (Table 1). Exports rose by ¼%, having been expected to grow by 3¼%, and net trade has dragged on GDP growth rather than making a positive contribution. Weaker-than-expected global growth may also have contributed to lower business investment growth.

Offsetting the downside news in business investment and net trade, household consumption growth has been stronger than anticipated in the February 2018 Report. Both employment and real wage growth have surprised on the upside and that is likely to have supported consumption. Favourable credit conditions (Section 1) may also have played a role.

Table 3 Potential supply growth has been a little lower than in the February 2018 projectionDecomposition of estimated potential supply growth^(a)

	February 2018 projection	Latest estimate	Difference
Potential supply^(b)	2.0	1.8	-0.2
of which, potential labour supply	0.5	1.0	0.5
of which, population	0.6	0.7	0.0
of which, participation	0.0	0.2	0.2
of which, unemployment ^(c)	0.0	0.0	0.0
of which, average hours	-0.3	0.0	0.3
of which, potential productivity	1.5	0.8	-0.7
of which, capital deepening ^{(d)(e)}	0.9	0.6	-0.3
of which, total factor productivity ^{(d)(f)}	0.6	0.2	-0.4

Sources: ONS and Bank calculations.

- (a) Contributions to potential supply growth between 2017 Q4 and 2019 Q1, unless otherwise stated. Contributions may not sum to the total due to rounding.
- (b) Per cent change between 2017 Q4 and 2019 Q1.
- (c) Positive numbers would indicate that a fall in the equilibrium unemployment rate has increased potential labour supply.
- (d) The decomposition is based on a growth-accounting framework using a constant returns to scale Cobb-Douglas production function, with the elasticity of output with respect to capital set to $\frac{1}{3}$. Total factor productivity is a residual.
- (e) Capital deepening refers to growth in capital services per person-hour. Capital includes structures, machinery, vehicles, computers, purchased software, own-account software, mineral exploration, artistic originals and R&D. Calculations are based on Oulton, N and Wallis, G (2016), 'Capital stocks and capital services: integrated and consistent estimates for the United Kingdom, 1950–2013', *Economic Modelling*.
- (f) Total factor productivity growth refers to improvements in the efficiency with which both capital and labour are used to produce output.

Supply growth has been slightly weaker than expected

Potential supply growth has been a little weaker than in the February 2018 projection. Within that, potential productivity growth is judged to have been lower than expected, largely offset by stronger-than-anticipated potential labour supply growth (Table 3).

In the February 2018 forecast, potential productivity was projected to increase by 1.5% between 2017 Q4 and 2019 Q1. This would have represented modest growth relative to the pre-crisis period — when it was estimated to have grown by more than 2% per year on average — but stronger growth than the post-crisis period. The latest estimates now suggest that potential productivity rose by 0.8%. This is estimated to have reflected both lower capital deepening than had been anticipated — which in turn is linked to the weakness of business investment growth — and slower growth in total factor productivity.

With potential supply growth and aggregate demand growth close to the February 2018 projections, the evolution of spare capacity has been broadly in line with expectations.

CPI inflation has been lower than expected, despite faster-than-expected pay growth

CPI inflation has surprised on the downside. It was 1.9% in 2019 Q1, 0.4 percentage points lower than anticipated (Table 2).

Table 4 Pattern of MPC forecast errors over time

Outturn data compared with past projections

	Projection date				
	February 2014	February 2015	February 2016	February 2017	February 2018 ^(a)
Percentage point differences in growth over five quarters, unless otherwise stated					
Headline indicators					
GDP	-0.1	-0.9	-0.5	0.0	0.0
Unemployment rate ^(b)	-1.1	-0.3	-0.3	-0.7	-0.3
CPI inflation ^(c)	-1.7	-1.0	0.9	0.0	-0.4
Potential supply and the labour market					
Potential supply	-0.2	-0.8	-0.3	-0.5	-0.2
Potential productivity	-1.0	-0.9	-1.1	-0.9	-0.7
Whole-economy AWE	-1.3	-1.8	-0.8	-0.7	0.3
Global output					
UK-weighted world GDP ^(d)	-0.1	-0.4	0.1	0.5	-1.0

Sources: Eikon by Refinitiv, IMF WEO, OECD, ONS and Bank calculations.

- (a) Where partial data are available for the quarter, Bank staff's projection for that quarter, based on those data, are used.
- (b) Differences between outturns and forecasts for the percentage point change in the unemployment rate. Negative values indicate that the unemployment rate was lower than expected.
- (c) Differences between outturns and forecasts for the annual CPI inflation rate in Q1 of the year after the forecast.
- (d) Constructed using data for real GDP growth rates for 180 countries weighted according to their shares in UK exports.

This downside news has occurred despite higher-than-expected labour cost growth. Labour is the largest domestic cost facing most businesses in the UK, and the combination of stronger-than-expected wage growth and weaker-than-expected productivity growth has meant that unit labour cost growth has been $\frac{3}{4}$ of a percentage point higher than anticipated (Table 1).

The downside news in CPI inflation has been concentrated in lower food price inflation. That could reflect the extent, or timing, of pass-through from the referendum-related sterling depreciation into food prices being different from what was expected. It may also have reflected margins in the food industry — as well as other businesses producing consumer goods and services — being squeezed. Margins are hard to measure, but some indicators do point to a squeeze over the past year (Section 4).

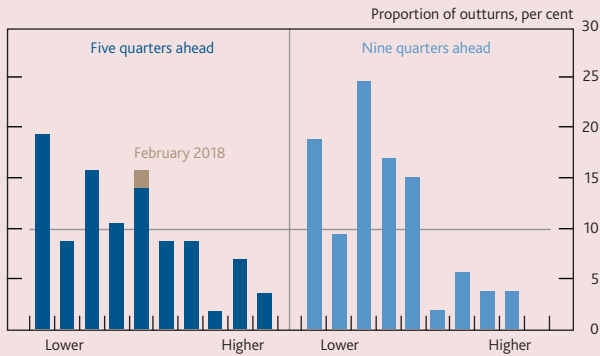
Over recent years, it is not clear that there has been a consistent pattern in CPI inflation forecast errors. CPI inflation was lower than projected in three of the five February *Reports* published since 2014, in one case it was higher, and in one case the data were in line with the forecast (Table 4).

Implications for the MPC's projections

These developments have been reflected in the MPC's latest projections and key judgements (Section 5).

In recent forecasts, the MPC has revised down its projection for global GDP growth, partly reflecting the unexpected weakness that materialised over 2018.

Chart B Dispersion of GDP growth outturns across deciles of the fan chart probability distribution^(a)



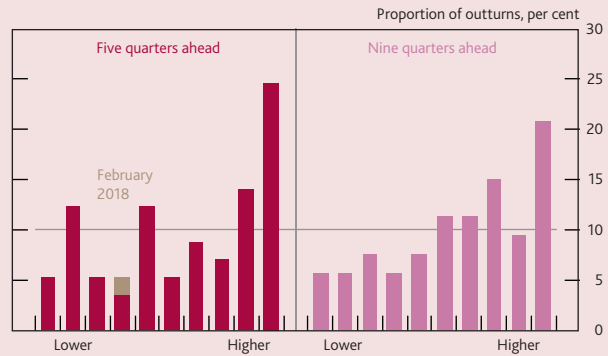
(a) Four-quarter GDP growth. Calculated for the market rate fan charts published since February 2004.

The news on the composition of domestic demand growth is also reflected in the latest forecast. Business investment is expected to remain weak while Brexit-related uncertainty persists, while household consumption growth is expected to continue at close to current rates.

The repeated undershoots in pay growth over previous years (Table 4), along with other evidence, led the MPC to revise down its estimate of the equilibrium unemployment rate from 5% to 4½% in early 2017 and to 4¼% in early 2018. Pay growth in 2018 picked up by more than expected, as the labour market tightened.

Over the past few years, productivity growth has repeatedly surprised to the downside with the unemployment rate falling more than expected (Table 4). This was one reason behind the MPC’s decision to revise down its productivity growth forecast

Chart C Dispersion of CPI inflation outturns across deciles of the fan chart probability distribution^(a)



(a) Calculated for the market rate fan charts published since February 2004.

in the February 2019 Report, following its regular reassessment of supply-side conditions. The MPC expects the unemployment rate to edge a little lower in the near term.

Outturns relative to the MPC’s fan charts

One way of assessing the significance of economic news is by comparing outturns against the MPC’s fan charts over time. If the fan charts accurately describe the uncertainty faced by the MPC, then absent any news in the conditioning paths, outturns would be expected to lie evenly across the fan chart distribution over time, with 10% of outcomes in each decile. Since 2004, GDP growth has tended to lie more often in the lower half of the fan chart distributions. The errors are more evenly distributed for CPI inflation apart from the top decile. The 2019 Q1 GDP growth outturn was in the lower half of the central band of the February 2018 fan chart (Charts A and B), as was inflation (Charts A and C).

Box 7 Other forecasters' expectations

This box reports the results of the Bank's most recent survey of external forecasters, carried out in April.⁽¹⁾ On average, respondents expected four-quarter GDP growth to pick up slightly over the next three years (Table 1). That is a little stronger than the May *Inflation Report* forecast in the near term, but weaker further out. The average probability placed on GDP growth being less than 1% in three years' time had fallen since the end of 2018, but remained elevated compared to before the referendum. The probability placed on growth being greater than 3% remained low (Chart A).

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

	2020 Q2	2021 Q2	2022 Q2
CPI inflation ^(b)	2.0	1.9	1.8
GDP growth ^(c)	1.4	1.6	1.7
LFS unemployment rate	4.3	4.4	4.4
Bank Rate (per cent)	1.0	1.3	1.5
Stock of purchased gilts (£ billions) ^(d)	435	434	427
Stock of purchased corporate bonds (£ billions) ^(d)	10	10	10
Sterling ERI	80.9	81.5	81.4

Source: Projections of outside forecasters as of 19 April 2019.

(a) For 2020 Q2, there were 15 forecasts for CPI inflation, 15 for GDP growth, 13 for the unemployment rate, 15 for Bank Rate, 10 for the stock of gilt purchases, 10 for the stock of corporate bond purchases and 8 for sterling ERI. For 2021 Q2, there were 13 forecasts for CPI inflation, 13 for GDP growth, 12 for the unemployment rate, 14 for Bank Rate, 10 for the stock of gilt purchases, 9 for the stock of corporate bond purchases and 8 for sterling ERI. For 2022 Q2, there were 10 forecasts for CPI inflation, 11 for GDP growth, 10 for the unemployment rate, 12 for Bank Rate, 9 for the stock of gilt purchases, 7 for the stock of corporate bond purchases and 7 for sterling ERI.

(b) Twelve-month rate.

(c) Four-quarter percentage change.

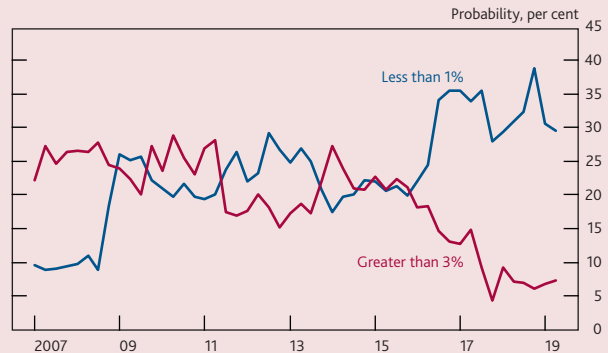
(d) Original purchase value. Purchased via the creation of central bank reserves.

External forecasters, on average, expected CPI inflation to dip slightly below the 2% target over the second two years of the forecast (Table 1). Forecasters' central projections for the unemployment rate implied a slight rise over the next three years — albeit by less than in February — and remained higher, on average, than the equivalent *Inflation Report* forecast (Section 5).

External forecasters' central projections for Bank Rate, on average, had fallen relative to three months ago (Chart B), along with the market-implied path for Bank Rate (Section 1). Nonetheless, forecasters' expectations for Bank Rate in three years' time remained around ½ a percentage point above the market-implied path upon which the May Report is conditioned. On average, external forecasters expected three rises in Bank Rate over the next three years, to 1.5%. As in recent surveys, almost all forecasters expected the current stock of gilt and corporate bond purchases to remain broadly stable over the next three years.

Chart A The probability of GDP growth in three years' time being less than 1% has fallen since the end of 2018, but remains elevated

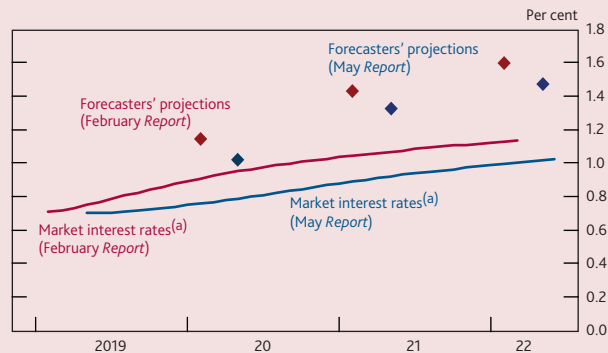
Averages of forecasters' probabilities attached to GDP growth outcomes in three years' time



Sources: Projections of outside forecasters provided for *Inflation Reports* between February 2007 and May 2019.

Chart B Forecasters' projections of Bank Rate remain higher than market interest rates

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 February 2019 and May 2019 and Bank calculations.

(a) Estimated using instantaneous forward overnight index swap rates in the 15 working days to 30 January 2019 and 24 April 2019 respectively.

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

Glossary and other information

Glossary of selected data and instruments

AWE – average weekly earnings.
CPI – consumer prices index.
CPI inflation – inflation measured by the consumer prices index.
DGI – domestically generated inflation.
DMP – Decision Maker Panel.
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.
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.
ECB – European Central Bank.
EU – European Union.
FTSE – Financial Times Stock Exchange.
G7 – Canada, France, Germany, Italy, Japan, the United Kingdom and the United States.
GfK – Gesellschaft für Konsumforschung, Great Britain Ltd.
GVA – gross value added.
ICE/BoAML – Intercontinental Exchange/Bank of America Merrill Lynch.
ICT – information and communications technology.
IMF – International Monetary Fund.

ISA – individual savings account.
LTV – loan to value.
MPC – Monetary Policy Committee.
MSCI – Morgan Stanley Capital International Inc.
MTIC – missing trader intra-community.
NPISH – non-profit institutions serving households.
OECD – Organisation for Economic Co-operation and Development.
Ofgem – Office of Gas and Electricity Markets.
ONS – Office for National Statistics.
PPP – purchasing power parity.
PwC – PricewaterhouseCoopers.
R&D – research and development.
REC – Recruitment and Employment Confederation.
RICS – Royal Institution of Chartered Surveyors.
S&P – Standard & Poor's.
SMEs – small and medium-sized enterprises.
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.