

# 3 Output and supply

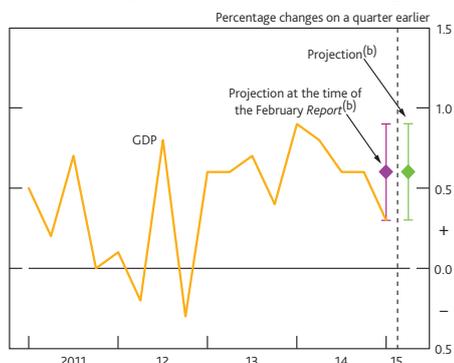
Output growth is estimated to have slowed to 0.3% in 2015 Q1, but is expected to be revised up to 0.5%. Four-quarter hourly productivity growth remained weak. Survey indicators suggest that capacity utilisation among companies eased slightly, but remained around normal levels. Total hours worked increased in the three months to February, as strong employment growth outweighed a modest fall in average hours. The unemployment rate fell further. Following a review of the evidence on potential supply, the MPC's best collective judgement is that the degree of slack is broadly in the region of ½% of GDP.

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

Developments anticipated in February	Developments since February
<b>Unemployment</b>	<b>Broadly as expected</b>
<ul style="list-style-type: none"> <li>Headline LFS unemployment rate to decline to around 5½% by mid-2015.</li> </ul>	<ul style="list-style-type: none"> <li>The unemployment rate fell to 5.6% in the three months to February, and is expected to be around 5.4% by mid-2015.</li> </ul>
<b>Participation</b>	<b>Broadly as expected</b>
<ul style="list-style-type: none"> <li>The labour market participation rate to pick up to around 63½% by 2015 Q3.</li> </ul>	<ul style="list-style-type: none"> <li>Participation rate was 63.5% in the three months to February. Projected to remain unchanged in Q2.</li> </ul>
<b>Average hours</b>	<b>Weaker than expected</b>
<ul style="list-style-type: none"> <li>Average hours worked to increase by almost 1% in the year to 2015 Q3.</li> </ul>	<ul style="list-style-type: none"> <li>Average hours fell by 0.3% in the three months to February.</li> </ul>
<b>Capacity utilisation</b>	<b>Broadly as expected</b>
<ul style="list-style-type: none"> <li>Indicators of spare capacity within companies to show little intensification of capacity pressures.</li> </ul>	<ul style="list-style-type: none"> <li>Survey indicators eased slightly, but remained around normal levels in 2015 Q1.</li> </ul>
<b>Productivity</b>	<b>Weaker than expected</b>
<ul style="list-style-type: none"> <li>Hourly labour productivity to average a little under ¾% in the first three quarters of 2015.</li> </ul>	<ul style="list-style-type: none"> <li>Hourly labour productivity growth was 0.3% in 2014 Q4.</li> </ul>

**Chart 3.1** GDP growth was weaker than expected in Q1

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



Sources: ONS and Bank calculations.

(a) Chained-volume measures. GDP is at market prices.

(b) The magenta diamond shows Bank staff's central projection for the preliminary estimate of GDP growth for Q1 at the time of the February Report. The green diamond shows the current staff projection for the preliminary estimate of GDP growth for Q2. The bands on either side of the diamonds show uncertainty around those projections based on one root mean squared error of forecasts for quarterly GDP growth made since 2004. As the staff projections are for the preliminary estimates of GDP, they can differ from those used to construct the GDP fans in Section 5, which are based on the MPC's best collective judgement of the final estimate of GDP.

## 3.1 Recent developments in output

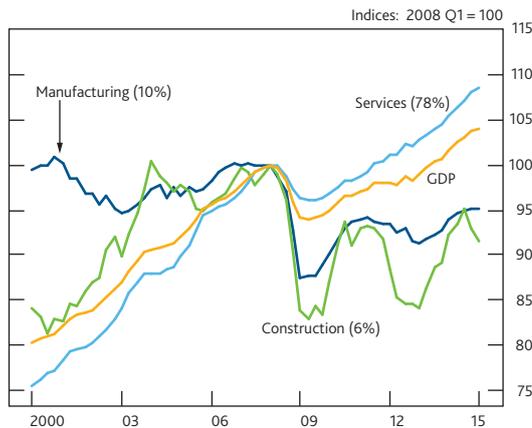
According to the ONS preliminary estimate, quarterly output growth was 0.3% in 2015 Q1, down from 0.6% in 2014 Q4, and weaker than anticipated in February (**Chart 3.1**). Weaker service sector — in particular, business services and finance — growth was the main source of the slowdown (**Chart 3.2**). Construction activity fell for the second consecutive quarter, driven by repair and maintenance, subtracting 0.1 percentage points from GDP growth. Following robust growth in 2014 H1, manufacturing output growth has slowed over the past few quarters (**Chart 3.2**), and was only 0.1% in Q1.

It is possible that some temporary factors weighed a little on growth in Q1. Uncertainty over the result and effects of the UK general election may have delayed some spending — for example in the construction sector — but reports from the Bank's Agents suggest little impact. The net support to demand from lower oil prices may also have been a little smaller in Q1 than had been anticipated, but it is too early to assess whether that might have been the case or whether there may be commensurately more support still to come.

It is likely that some of the weakness in the Q1 data may be revised away. Survey indicators suggest that growth was higher in Q1 than indicated by the official data, for example in the construction sector (**Chart 3.3**). Taking the strength of the surveys together with the pattern of past revisions to the official data, Bank staff's central expectation is that Q1 growth will be revised up to 0.5% as the data mature.

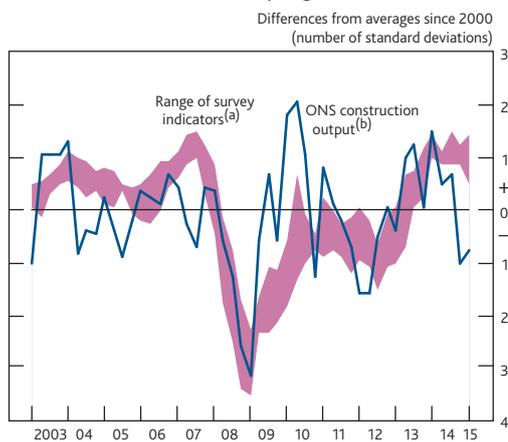
Overall, the official GDP data for Q1 are not judged to signal a weaker outlook for near-term growth. Survey indicators for Q2 have remained relatively robust and Bank staff project the preliminary estimate for Q2 GDP growth to be 0.6% (**Chart 3.1**). The final estimate incorporated into the MPC's GDP fan chart is 0.7%.

**Chart 3.2 Service sector output growth slowed in Q1**  
GDP and sectoral output<sup>(a)</sup>



(a) Chained-volume measures. GDP is at market prices. Indices of sectoral output are at basic prices. The figures in parentheses show 2011 weights in gross value added.

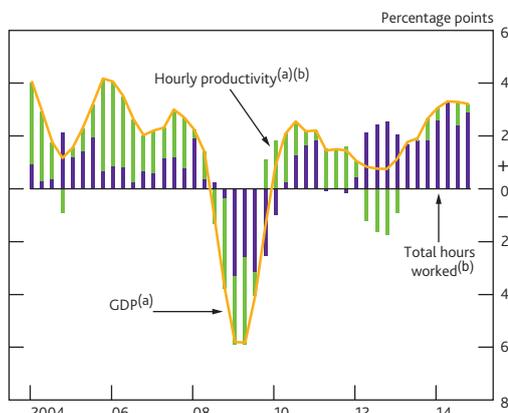
**Chart 3.3 Survey indicators suggest construction growth remained positive in Q1**  
Indicators of construction output growth



Sources: Bank of England, Experian, Markit/CIPS and ONS.

(a) Measures included are the Bank's Agents' end-quarter score for construction output relative to a year ago, the quarterly average of the Markit/CIPS construction activity index and the quarterly average of the Experian construction activity index. Data are to 2015 Q1.  
(b) Chained-volume measure. Quarterly growth.

**Chart 3.4 GDP growth has been associated with strong growth in hours worked but little growth in productivity**  
Decomposition of four-quarter GDP growth



Sources: ONS and Bank calculations.

(a) Chained-volume measure, based on the MPC's best collective judgement of the final estimate of GDP. Percentage change on a year earlier.  
(b) Based on Bank staff's assumption for population growth, as explained in footnote (a) of Chart 3.9.

## 3.2 Potential supply and slack in the economy

The outlook for output growth depends on demand (Section 2) and also, over the medium term, on the supply capacity of the economy. The balance between demand and potential supply — that is, the degree of slack or spare capacity — is an important determinant of inflationary pressures in the medium term. In May, the MPC reassessed the outlook for potential supply and the implications for the degree of slack in the economy. The box on page 24 summarises its findings.

The supply side of the economy cannot be directly observed and there is significant uncertainty around the extent to which output can grow before it generates upward pressure on costs and prices. The MPC, therefore, monitors a range of indicators of the level of potential supply, its likely evolution and the extent to which current activity is above or below it.

One common approach is to use statistical techniques to estimate potential supply from a top-down perspective using past observations of GDP and other indicators of slack, such as unemployment. In addition to looking at those top-down measures, the MPC also assesses the components of supply from a bottom-up perspective: productivity and capacity utilisation are discussed in Section 3.2.1, and the supply of labour in Section 3.2.2. Statistical estimates of potential supply that include nominal indicators, such as wages, suggest that slack could be notably greater than an assessment of the bottom-up components would imply. But the degree of uncertainty around these estimates is large and there is a range of views on the MPC as to how much weight to place on them. Overall, as discussed in Section 3.2.3, the MPC's best collective judgement is that slack is broadly in the region of ½% of GDP.

### 3.2.1 Productivity growth and capacity utilisation

#### Productivity growth

Growth in labour productivity, defined as output per hour worked, fell sharply during the financial crisis. Previous analysis by Bank staff identified a number of factors that are likely to have contributed to persistent weakness in productivity following the financial crisis.<sup>(1)</sup> Despite robust output growth in the past few years, productivity growth has remained subdued with the increases in output having been met mainly through an increase in total hours worked (Chart 3.4).

Labour productivity growth can be decomposed into the contribution from two factors: growth in the amount of

(1) See Barnett, A, Batten, S, Chiu, A, Franklin, J and Sebastián-Barriol, M (2014), 'The UK productivity puzzle', *Bank of England Quarterly Bulletin*, Vol. 54, No. 2, pages 114–28; [www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q201.pdf](http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q201.pdf).

## The MPC's assessment of potential supply

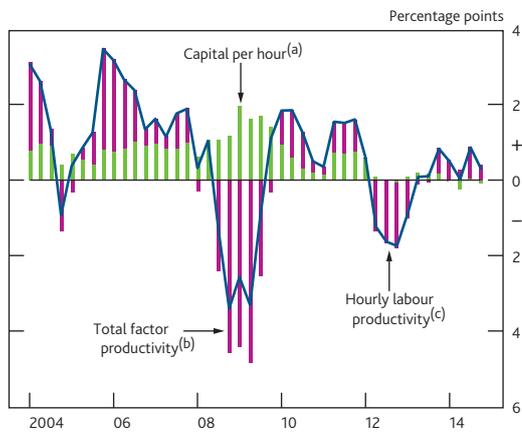
In May, the MPC reassessed the outlook for potential supply in the medium term and the degree of slack in the economy. That assessment is set out throughout this section, with the implications for the outlook set out in Section 5; this box summarises the findings. Combining all the evidence, including top-down statistical estimates and bottom-up

evidence on the components of supply, the MPC's best collective judgement is that slack is broadly in the region of ½% of GDP and that supply growth is likely to pick up over the forecast period, reflecting a revival in productivity growth. But there is considerable uncertainty around the current degree of slack and its likely evolution, and a wide range of views on the Committee.

Component	Evidence	Implications
<b>Overall supply (Section 3.2.3)</b>	Potential supply has grown modestly over the past couple of years, particularly relative to GDP. Robust labour supply growth has been partially offset by exceptionally weak productivity growth (Chart 3.4). While evidence on the components of supply suggests there is probably only a small degree of slack, top-down statistical measures that include nominal indicators, such as wage growth, suggest that slack could be notably greater.	Overall, slack in the economy is judged to be broadly in the region of ½% of GDP. Supply growth in the medium term is likely to be supported by a resumption in productivity growth as labour supply growth wanes.
<b>Productivity and capacity utilisation within companies (Section 3.2.1)</b>	Productivity growth has been persistently weak since the start of the crisis and, despite the pickup in output growth, has remained subdued in recent years (Chart 3.5). Some of that weakness is likely to be accounted for by a shift in the composition of employment growth towards lower-skilled occupations (Chart 3.6). A lack of reallocation of resources from low to high-productivity companies may also be weighing on growth.  Indicators suggest that capacity utilisation within companies is broadly around normal levels, although there is a wide variation between measures (Chart 3.7).	Compositional effects will only bear down on productivity growth as long as such shifts continue. As business investment picks up and the normal process of reallocation of resources between companies resumes, productivity growth is likely to return gradually towards its historical average growth rate.
<b>Labour supply (Section 3.2.2)</b>		
<b>Population growth</b>	Population growth is likely to have been robust in the past few years, reflecting stronger-than-expected net inward migration.	Population growth is assumed to remain strong in the near term before falling back towards its average rate over the past two decades (Chart 3.9).
<b>Participation</b>	Participation was on an upward trend in the decade prior to the crisis, but then fell sharply (Chart 3.10). Over the past two years, the participation rate has recovered then broadly stabilised: a range of evidence suggests that reflected a cyclical rise back to its equilibrium rate.	The cyclical recovery in participation is likely to have broadly taken place. The medium-term equilibrium participation rate is likely to remain flat as the drag from an ageing population broadly offsets the upward pressure from a shift towards longer working lives.
<b>Unemployment</b>	The unemployment rate has fallen substantially over the past two years (Chart 3.13), although the proportion of those out of work for more than a year remains elevated.  Although there is uncertainty about the long-term equilibrium unemployment rate, structural changes in the labour market and evidence on recruitment difficulties point to two-sided risks around a central judgement that it is about 5%.	The medium-term equilibrium unemployment rate is likely to be only slightly below the current unemployment rate and will fall back towards its long-term rate of around 5% as the share of long-term unemployed continues to decline (Chart 3.14).
<b>Average hours</b>	Average hours worked have continued to increase over the past two years (Chart 3.15). Signs of underemployment remain, with average weekly hours worked still below the hours people, on average, report that they would like to work. There is evidence to suggest that people may be satisfied with smaller increases in hours, however.	The medium-term equilibrium level of average hours is probably slightly higher than current average hours worked (Chart 3.15), but is likely to fall a little over the forecast period.

### Chart 3.5 Weak growth in capital per hour and total factor productivity have both contributed to subdued labour productivity growth

Contributions to four-quarter hourly labour productivity growth

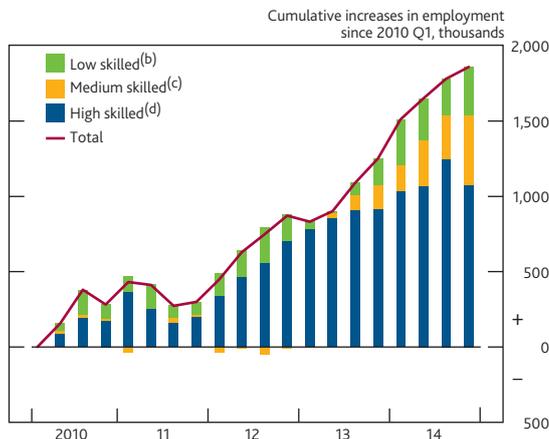


Sources: ONS and Bank calculations.

- (a) Fixed capital stock, including 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 (2015), 'Integrated estimates of capital stocks and services for the United Kingdom: 1950–2013', *Centre for Economic Performance Discussion Papers No. 1342*.
- (b) Total factor productivity is calculated as a residual.
- (c) Hourly productivity is based on the MPC's best collective judgement about the final estimate of GDP and Bank staff's assumption for population growth, as explained in footnote (a) of Chart 3.9. Percentage change on a year earlier.

### Chart 3.6 Recent employment growth has been concentrated in lower-skilled jobs

Employment growth by occupational skill level<sup>(a)</sup>



Sources: Labour Force Survey and Bank calculations.

- (a) Uses the Standard Occupational Classification (SOC) 2010. The data for estimates prior to 2011 were collected on the previous SOC basis (SOC 2000) and have been mapped to an equivalent SOC 2010 basis. Seasonally adjusted by Bank staff.
- (b) Includes elementary occupations, plant machine operatives, sales and customer services.
- (c) Calculated as total employment less employment in high and low-skilled occupations.
- (d) Includes managers, professional and associate professional and technical occupations.

capital per hour worked — that is, the equipment and resources that are available to produce output — and growth in total factor productivity (TFP), which is the efficiency with which a given amount of inputs (labour and capital) can be used to produce output.

Although growth in capital per hour worked and total factor productivity are difficult to measure, Bank staff estimates suggest that both have weakened over the past few years (Chart 3.5). Weak growth in capital per hour, in part, reflects falls in business investment during the financial crisis, which will have fed through into the capital stock with a lag, as well as robust growth in total hours worked (Section 3.2.2). But the contribution from TFP growth to labour productivity growth has been particularly weak over the past few years (Chart 3.5). Bank staff analysis points to a number of factors that could have acted as a drag on TFP growth over the past three years.

First, changes in the composition of the labour force will have implications for measured aggregate TFP growth, even if they do not affect the productivity of any individual. Since mid-2013, employment growth has been more concentrated in lower-skilled occupations (Chart 3.6) and among employees with fewer qualifications and those who are new to their roles. To the extent that these characteristics are associated with lower levels of productivity, this shift in the composition of the labour force could have dragged on aggregate productivity growth over the past two years; broadly similar to its impact on overall average wage growth (Section 4). But these compositional effects will only drag on productivity growth for as long as such shifts continue.

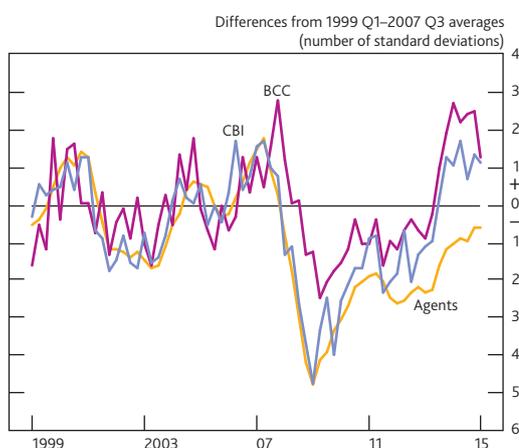
Second, it is possible that some of the factors associated with the financial crisis may be having a persistent impact on TFP growth. For example, forbearance and a low level of Bank Rate could have allowed businesses that face persistently lower demand to remain operational. This may have impaired the reallocation of resources to new or more dynamic companies with the potential to achieve higher productivity, weighing on overall productivity growth in the economy.

Third, weaker investment in not only physical but also 'intangible' capital, such as employees' skills, may have reduced the pace of innovation and hindered companies' ability to adopt more innovative processes. Indeed, Bank staff analysis suggests that TFP has grown more slowly in the United Kingdom than in some other advanced economies, notably the United States.

The MPC's best collective judgement is that productivity growth will pick up gradually over the forecast, boosting the supply capacity of the economy, as the impact of these factors gradually wanes (Section 5).

**Chart 3.7 Capacity utilisation little changed over the past year**

Survey indicators of capacity utilisation<sup>(a)</sup>



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

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

## Capacity utilisation

One way in which productivity growth could pick up in the short term is if companies have unused capacity: companies could then use their existing capital and labour more intensely as demand increases. As capacity utilisation rises, however, companies are likely to face increasing cost pressures and are more likely to raise their prices, putting upward pressure on inflation. In the medium term, the rate at which capacity can increase in response to higher demand will depend on the extent to which companies invest in capital, innovate and are able to hire employees with relevant skills (Section 3.2.2).

Capacity utilisation cannot be directly measured, so the MPC monitors a range of survey indicators to assess the extent to which companies are operating above or below normal levels of capacity. Measuring the normal level of capacity utilisation is not straightforward, particularly given that most of these surveys are qualitative. One approach is to compare recent survey data to historical averages. There is currently an unusually wide degree of variation among survey measures. But, taken together, they appear broadly around past average levels and slightly lower than in Q4 (Chart 3.7).

Survey indicators may not, however, be a good guide as to whether capacity utilisation is close to rates that companies would have considered normal in the past. For example, the protracted period of low demand following the crisis may mean that companies have become used to operating with a greater degree of spare capacity. Almost half of the respondents to a recent Markit/CIPS survey indicated that they could increase output by more than 10% without putting upward pressure on prices, with 35% of respondents indicating that they could accommodate a 5%–10% increase. It is difficult to know, however, whether that is higher than the utilisation rates typically seen in the past: companies are likely to prefer to maintain some spare capacity to allow for fluctuations in demand. Overall, the MPC judges that capacity utilisation is broadly around normal.

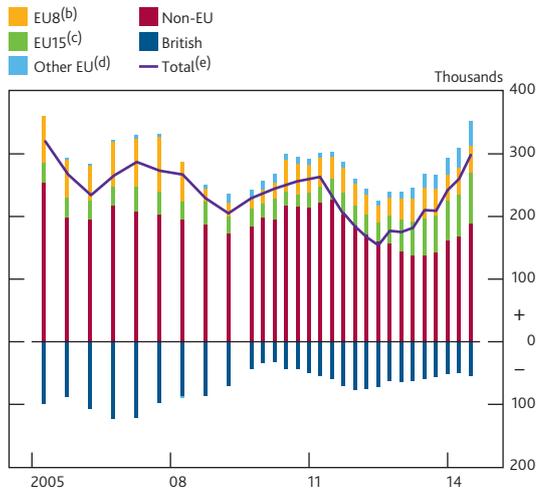
## 3.2.2 Labour market developments

A key component of potential supply in the economy is the potential supply of labour, measured in terms of total potential hours worked. Labour market slack represents the extent to which total hours worked are below potential hours. In assessing labour market slack, the MPC considers three components of it: participation, average hours worked and unemployment.

Overall, the MPC judges that the margin of labour market slack is broadly similar to that in February, but that its composition is likely to be slightly different. The MPC previously judged that slack was concentrated in participation, with some slack in unemployment and a very small amount in average hours. The MPC now judges there is likely to be less

**Chart 3.8 Net migration has increased over the past few years**

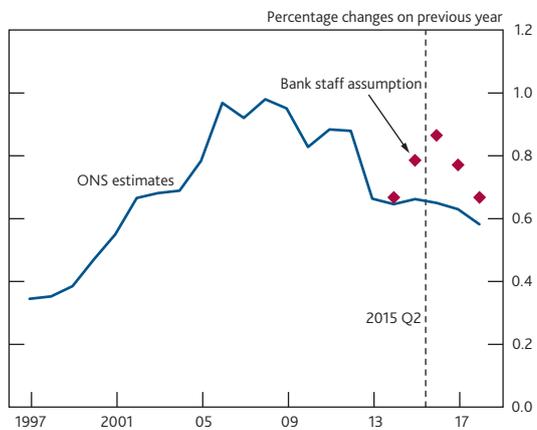
Net inward migration by nationality<sup>(a)</sup>



Sources: ONS and Bank calculations.

- (a) Rolling four-quarter flows. Data are half-yearly to December 2009 and quarterly thereafter, unless otherwise stated. Total net migration figures between 2001 and 2011 have been revised in light of the 2011 Census. These revisions are not reflected in the figures by nationality, so these will not sum to the total.  
 (b) Includes Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.  
 (c) Includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, Netherlands, Portugal, Republic of Ireland, Spain and Sweden. Excludes the United Kingdom.  
 (d) Includes Bulgaria, Croatia, Cyprus, Malta and Romania.  
 (e) Data are half-yearly to December 2011 and quarterly thereafter.

**Chart 3.9 ONS population growth is likely to be revised up**  
Population<sup>(a)</sup>



Sources: ONS and Bank calculations.

- (a) 16+ population, calendar-year averages. The ONS's population estimates, used in the Labour Force Survey, were last updated using data for 2012 and are based on the assumption of net inward migration of around 165,000 per year from 2013 onwards. Higher-frequency data suggest the increase has averaged around 250,000 per year during this time. Bank staff's assumption, shown in the red diamonds as calendar-year averages, is based on the ONS's population estimates, adjusted for the latest migration statistics. The projection assumes that net migration gradually falls from recent highs so that net migration is around its 2004–14 average by late 2016. These stronger net migration flows will be incorporated into the ONS's population statistics later this year, involving a thorough process involving aggregation at a regional level and by age and gender, and will hence differ from the simple calculations undertaken by Bank staff. The ONS's revised population statistics will be reflected in the Labour Force Survey in 2016.

slack in participation, but more in average hours. There is, however, significant uncertainty around these judgements and a range of views within the Committee.

### Population and participation in the labour market

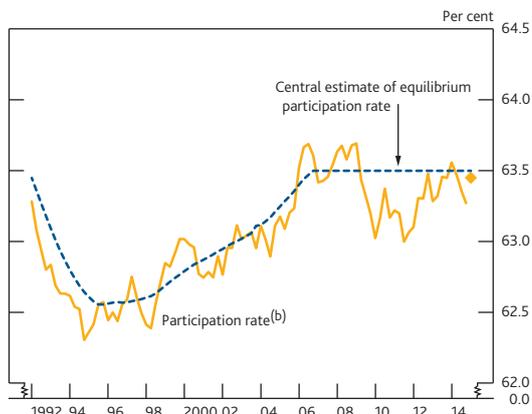
Sustained growth in the supply of labour derives mainly from growth in the overall population. High net inward migration in the past two years (**Chart 3.8**) means that population growth and the overall potential supply of labour has probably been greater than previously assumed. Net inward migration was close to a historical high of just under 300,000, around 0.5% of the population, in the four quarters to 2014 Q3. That is well above the 165,000 per year assumed in the ONS's population projections, which were last updated in 2012, and upon which the Labour Force Survey is based. The ONS's population projections are likely to be revised up later this year when new information, including recent data on migration, is incorporated. In anticipation of this, Bank staff have revised up their assumptions about population growth from 2013 onwards on the basis of higher net migration (**Chart 3.9**). The outlook for net migration is highly uncertain, and is likely to depend on a number of factors such as the United Kingdom's relative economic performance and also UK government policy. In the MPC's central projection, population growth slows over the forecast period towards its average rate over the past two decades.

Participation rates are another key determinant of labour supply. In the decade prior to the financial crisis, labour participation was on an upward trend (**Chart 3.10**), in part reflecting an increase in female participation and older people working for longer.<sup>(1)</sup> Following the recession, participation fell sharply as labour market conditions deteriorated. Changes in participation among young and older age groups had a significant impact on the aggregate participation rate: deteriorating labour market conditions appear to have encouraged more young people to study and older people to retire early during the recession.

Participation has since risen from its post-recession trough and was 63.5% of the 16+ population in the three months to February. A key uncertainty is the extent to which the participation rate is now in line with its medium-term equilibrium rate, or is still below it due to cyclical factors. Participation among older age groups appears largely to have returned to its upward pre-crisis trend, while participation among younger age groups is now only slightly below its pre-crisis declining trend (**Chart 3.11**). In addition, the number of economically inactive people responding to the Labour Force Survey that they want a job has fallen back to pre-crisis levels after having risen during the recession. It therefore appears possible that the cyclical recovery in participation

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

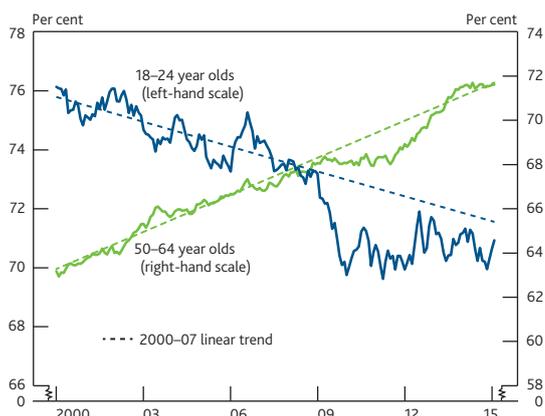
**Chart 3.10 Participation is likely to be close to its trend rate**  
Actual participation rate and Bank staff estimate of the medium-term equilibrium participation rate<sup>(a)</sup>



Sources: Labour Force Survey and Bank calculations.

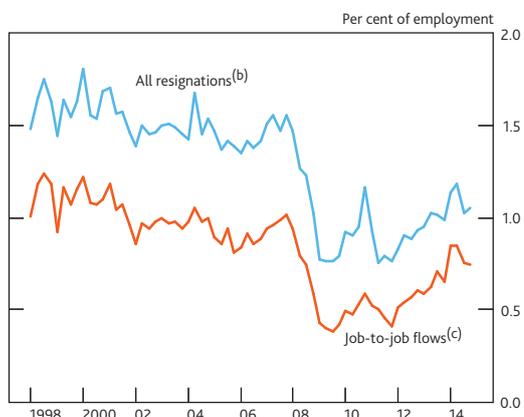
- (a) Percentages of 16+ population.  
(b) The diamond shows Bank staff's projection for 2015 Q1, based on ONS data up to February 2015.

**Chart 3.11 Participation rates among young and older age groups are close to pre-crisis trends**  
Participation rates for 18–24 and 50–64 year olds



Sources: Labour Force Survey and Bank calculations.

**Chart 3.12 Labour market turnover has picked up, but remains below pre-crisis levels**  
Resignations and job-to-job flows<sup>(a)</sup>



Sources: Labour Force Survey and Bank calculations.

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

associated with the recovery in labour market conditions has largely taken place.

Bank staff have therefore revised down their estimate of the medium-term equilibrium participation rate and hence the gap between actual and medium-term equilibrium participation (**Chart 3.10**). The outlook for participation is subject to considerable uncertainty and depends on two broadly offsetting structural factors: the desire of older age groups to work longer, which is likely to boost participation, offset by a drag from an ageing population. Bank staff, overall, judge that the medium-term equilibrium participation rate is likely to remain broadly flat (**Section 5**).

### Employment and unemployment

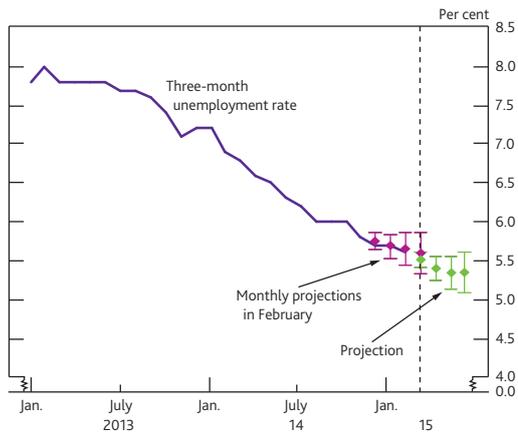
Labour market conditions have continued to improve, although turnover remains below pre-crisis rates (**Chart 3.12**). Indicators suggest that the demand for labour was strong in early 2015: employment grew by around 248,000 in the three months to February, more than anticipated three months ago. The rise was driven by an increase in full-time employees; self-employment was broadly unchanged. Surveys of employment intentions point to further steady growth in employment in Q2. These indicators, together with a historically high level of vacancies, suggest that labour demand growth is likely to remain relatively strong in the near term.

Reflecting the growth in employment, the unemployment rate fell to 5.6% in the three months to February compared with 5.8% in the three months to November, broadly as expected. Further falls are likely in the near term (**Chart 3.13**). Indeed, the claimant count, a timely indicator of the unemployment rate, fell further in March.

The unemployment rate is now close to Bank staff's estimate of the medium-term equilibrium unemployment rate (**Chart 3.14**). The difference between unemployment and its medium-term equilibrium rate attempts to capture the pressure the unemployed exert on wage growth. This pressure is likely, in part, to reflect the length of time people have been out of work: the longer-term unemployed tend to exert less downward pressure on wages than the short-term unemployed. With long-term unemployment remaining relatively high, the unemployed are currently assumed to be exerting relatively little downward pressure on wages. There is, however, scope for the unemployment rate to fall further without putting excess upward pressure on wage growth as, over time, the medium-term equilibrium rate should tend towards its long-term equilibrium rate, which is determined by structural characteristics of the labour market such as out-of-work benefits. That long-term rate is estimated by Bank staff to be around 5% (**Chart 3.14**).

There is considerable uncertainty around the long-term equilibrium unemployment rate. It may be lower than

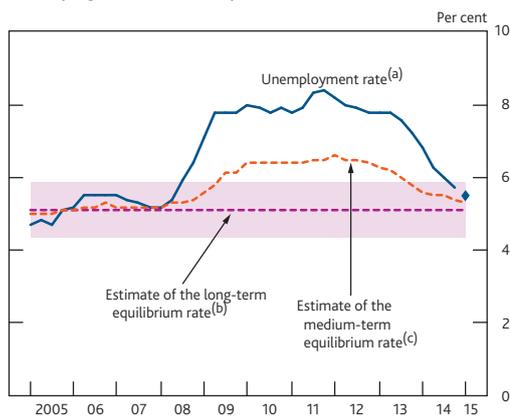
**Chart 3.13 Unemployment likely to fall further**  
Bank staff's near-term unemployment rate projection<sup>(a)</sup>



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

(a) The magenta diamonds show Bank staff's central projections for the headline unemployment rate for December 2014 and January, February and March 2015, at the time of the February Report. The green diamonds show the current staff projections for the headline unemployment rate for March, April, May and June 2015. The bands on either side of the diamonds show uncertainty around those projections based on one root mean squared error of past Bank staff forecasts for the three-month LFS unemployment rate.

**Chart 3.14 Unemployment is currently close to its estimated medium-term equilibrium rate**  
Unemployment and its equilibrium rates



Sources: Labour Force Survey and Bank calculations.

(a) Percentage of the economically active population. Quarterly data. The diamond shows Bank staff's projection for 2015 Q1, based on official data up to February 2015.  
(b) Bank staff estimate. The swathe around the central staff estimate of the natural rate reflects uncertainty about the parameters in the estimated model, but does not capture uncertainty about model misspecification. The true uncertainty is likely to be much larger.  
(c) Bank staff estimate. This proxy measure is based on a simple calculation rather than an estimated model, so there are no associated errors bands to reflect estimation uncertainty, but there is considerable uncertainty about how well this proxy measure captures the medium-term equilibrium unemployment rate.

**Table 3.B Labour market conditions have tightened over the past year**  
Indicators of labour market tightness

	Averages					
	1998–2007 <sup>(a)</sup>	2010–12	2013	2014 H1	2014 H2	2015 Q1
Vacancies/unemployed ratio <sup>(b)(c)</sup>	0.41	0.18	0.22	0.30	0.36	0.39
People working part-time because they could not find a full-time job <sup>(b)(d)</sup>	2.2	4.3	4.8	4.5	4.3	4.3
Agents' scores of companies' recruitment difficulties <sup>(e)</sup>	0.5	-1.1	-0.4	0.7	1.7	1.5

Sources: Bank of England and Labour Force Survey.

(a) Unless otherwise stated.  
(b) The figure for 2015 Q1 shows data for the three months to February.  
(c) Number of vacancies (excluding agriculture, forestry and fishing) divided by LFS unemployment. Average since 2001 Q2.  
(d) As reported to the LFS. Percentage of LFS total employment.  
(e) End-quarter observations on a scale of -5 to +5, with positive scores indicating greater recruitment difficulties in the most recent three months compared with a year earlier. Average since 2005 Q1.

currently assumed, for example due to improved job search technology and changes to the tax and benefit system over many years. Alternatively, it could be higher, if there is mismatch between the skills of the unemployed and the skills that companies are seeking; surveys such as that conducted by the Bank's Agents, for example, suggest that recruitment difficulties have increased over the past year (Table 3.B).

### Hours worked

The contribution of each person in work to overall labour supply will depend on the number of hours that they work. Over the past few years, additional output has been produced by more people working and by higher average hours worked per person. In the three months to February, growth in total hours was 0.5%, slightly weaker than expected at the time of the February Report. While employment growth was strong, average hours fell, compared with expectations of a rise. Average hours are likely to pick up in Q2, however, reflecting continued strength in labour demand.

A key question is the extent to which companies can increase the average hours of their employees in the face of tightening labour market conditions without putting upward pressure on wage costs. Average hours have risen strongly from their trough following the crisis, but, on balance, there remain signs of underemployment. For example, desired hours reported in the Labour Force Survey remain above actual average hours (Chart 3.15) and the proportion of part-time staff who report that they would prefer a full-time job remains high (Table 3.B). But there is evidence to suggest that people are, on average, satisfied by smaller increases in hours than they previously reported they wanted.<sup>(1)</sup> For example, some of the strength in average desired hours is likely to reflect households wishing to work more to make up for the past squeeze in their real income. If so, as real incomes rise, they may be less keen to work these extra hours. In addition, some of the rise in average hours reflects a decline in leave taken since the crisis. As people start to feel more secure in their jobs, some of that decline could unwind, reducing average hours.

Average hours are nonetheless estimated to be somewhat below their medium-term equilibrium level. That medium-term level, which attempts to abstract from short-term influences such as cyclical fluctuations in income growth, is estimated to have risen during the crisis, albeit by less than the increase in reported desired hours. The continued rise in average hours over the past year, together with indicators of underemployment remaining elevated, led Bank staff to revise up the estimate of the medium-term level in May, relative to that estimated in February. In Q1, average hours are estimated to have been well below their medium-term level, suggesting scope for further rises in

(1) For a discussion, see Weale, M (2014), 'Slack and the labour market'; [www.bankofengland.co.uk/publications/Documents/speeches/2014/speech716.pdf](http://www.bankofengland.co.uk/publications/Documents/speeches/2014/speech716.pdf).

## The impact of alternative paths for labour supply

Medium-term economic growth depends crucially on how quickly the supply capacity of the economy can expand. Potential labour supply — the total number of hours households are willing to work — is a key aspect of overall supply capacity, and depends on a number of factors. First, the size of the population. Second, the proportion of the population that wants to work (the equilibrium participation rate). Third, how easily those people can find a suitable job (the equilibrium unemployment rate). And fourth, how many hours each person would like to work when employed (equilibrium average hours).

The MPC's assessment of potential labour supply is set out in the box on page 24. How fast potential labour supply will grow is highly uncertain. This box sets out some of the key risks to potential labour supply growth and, using a model-based simulation, what the consequences for output and CPI inflation might be if potential labour supply evolved differently to the assumptions underlying the MPC's projections.

### Key risks to the outlook for labour supply

The MPC's projections assume that potential labour supply growth slows over the next three years. That reflects: a slowing in population growth, as net migration flows return to their average over the past decade; a flat equilibrium participation rate; and small declines in equilibrium unemployment and average hours. There are a number of reasons why potential labour supply could grow more quickly than that. Concerns about retirement income could lead to larger increases in the participation rates of older workers, and the overall participation rate could rise. There may be more scope for the equilibrium unemployment rate to fall, for example if matching technology has improved. There are also, however, a number of reasons why potential labour supply may grow more slowly. Equilibrium average hours could fall back further than assumed if, for example, people on average decided that they would prefer to work shorter hours. The aggregate participation rate could fall if the participation rates for older workers stop rising, for example if pensioners begin to feel more secure about their retirement income.

### The transmission of faster growth in labour supply

One way to understand how a different path for potential labour supply could affect the outlook for GDP and CPI inflation is to use an illustrative model-based simulation. This box considers the scenario where potential labour supply growth is 0.5 percentage points higher over the next year, so growth remains around its current level for a further year, before subsequently falling back towards its historical average. Slower, rather than faster, labour supply growth would work

through the same channels discussed below, but with opposite effects.

As with any model-based simulation, there is a great deal of simplification relative to the real world, and the impact is highly uncertain. Specific assumptions made in this scenario include:<sup>(1)</sup>

- that the way in which labour supply adjusts — be that through population, or equilibrium participation, unemployment or average hours — and how it is distributed across the population do not matter for the impact;
- that the higher potential labour supply is not anticipated;
- that, once households know potential labour supply is higher, they start to increase consumption before their income rises;
- that hourly productivity growth does not change following the increase in potential labour supply;
- that the monetary policy maker does not respond to stronger potential labour supply, and the exchange rate does not move; and
- that the path for labour supply over the past is unchanged.

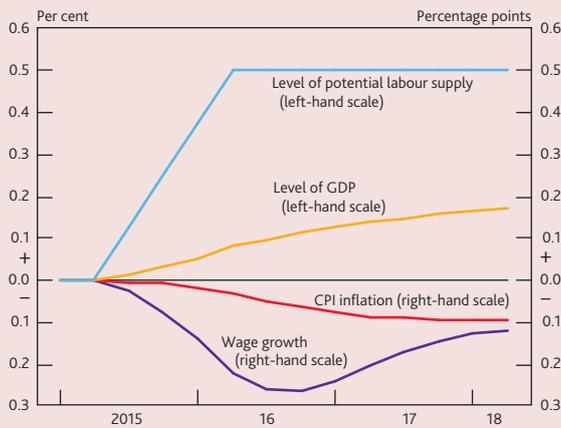
While there is uncertainty around the precise estimates from the simulation, the results suggest that higher potential labour supply would reduce inflationary pressures, but raise the level of GDP, during the forecast period, albeit by a small amount. Inflationary pressures fall because a wider margin of slack opens up as the additional labour supply is not initially employed. The extra slack increases competition for jobs and reduces the pressure on businesses to raise wages. The model-based simulation suggests that wage growth would be around 0.3 percentage points weaker after about a year (**Chart A**). Although lower wage growth will reduce household income initially, the number of hours households expect to work in aggregate will increase their future income expectations. Some households will therefore start to increase consumption in anticipation of higher future income. To satisfy this demand, businesses will increase their labour demand. Businesses will also increase investment to maintain the level of capital for each hour of labour they employ, and so the level of productivity. Higher consumption and investment mean that the level of GDP would be around 0.2% higher after three years.

In this simulation, slack is a little wider throughout the forecast period despite higher labour demand. Although GDP and labour demand grow more strongly that is not enough to

(1) This simulation has been produced by unexpectedly shocking the number of hours people would want to work if wages and prices are fully flexible in the Bank's central forecasting model. For more information about the Bank's central forecasting model and range of supporting models, see Burgess *et al* (2013), 'The Bank of England's forecasting platform: COMPASS, MAPS, EASE and the suite of models', *Bank of England Working Paper No. 471*; [www.bankofengland.co.uk/research/Documents/workingpapers/2013/wp471.pdf](http://www.bankofengland.co.uk/research/Documents/workingpapers/2013/wp471.pdf).

**Chart A Higher labour supply would tend to be associated with higher GDP and lower inflation**

Model-based response to higher labour supply



absorb all the increase in potential labour supply (Table 1). That additional slack weighs on wage growth throughout the forecast period. Lower wage growth reduces the pressure on businesses to raise their prices. In this scenario, CPI inflation would be around 0.1 percentage points lower after three years.

**Table 1 An initially wider margin of slack gradually narrows**

Additional potential labour supply and hours worked

Per cent difference from baseline	2016 Q2	2017 Q2	2018 Q2
Potential labour supply	0.5	0.5	0.5
Total hours worked	0.1	0.2	0.2
Labour market slack <sup>(a)</sup>	0.4	0.3	0.3

(a) Per cent of potential labour supply.

### Sensitivities in the scenario

The model-based simulation presented in this box is highly stylised, and sensitive to how quickly households increase their spending in response to higher potential labour supply. The smaller or slower the demand response, the stronger the disinflationary pressures from higher potential labour supply will be. Conversely, if demand picked up by a greater amount or more quickly, the disinflationary effects would be weaker.

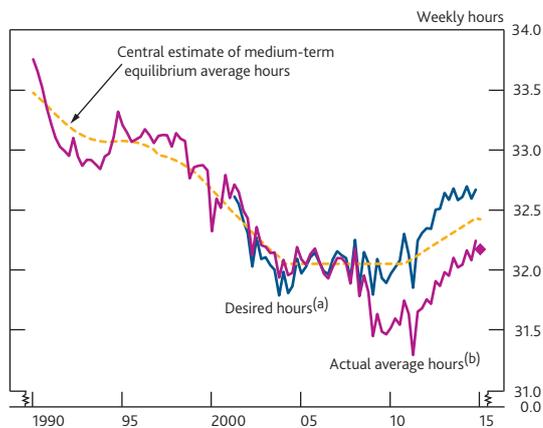
One factor that will affect how quickly demand responds to higher labour supply will be the response of the monetary policy maker. The results of this scenario assume that there is no response. A simple mechanical policy reaction function, responding to inflation and slack, would suggest a loosening in monetary policy in this scenario. In practice, the policymaker's response would take into account broader economic developments and conditions. In response to looser monetary policy, demand would grow more quickly, and more of the additional potential labour supply would be employed, reducing disinflationary pressure.

Another factor that will affect the response of demand will be the extent to which households anticipate faster potential labour supply growth. If households anticipate that growth will be quicker, some would be likely to increase their consumption sooner, in anticipation of higher income. Whether households anticipate that their income is likely to be higher will probably depend, in part, on the reason for stronger potential labour supply. For example, households may be quick to increase their consumption if they expect to be able to work more hours in the future. Similarly, if potential labour supply increased because of higher net inward migration, consumption is likely to increase relatively quickly as migrants will face expenses before they necessarily get a job. In contrast, households may be less likely to foresee an increase in the likelihood of finding a job, and hence may increase their consumption only very gradually in response.

How much demand increases also depends on how much is produced in the extra hours worked. The scenario assumes that hourly productivity on average across the economy does not change as the number of hours worked increases. But if the increase in potential labour supply were concentrated in particularly productive jobs, productivity could also increase. That could lead to a larger increase in demand. Conversely if the increase were concentrated in less productive jobs, demand might increase by less.

### Chart 3.15 Average hours remain below desired and equilibrium average hours

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



Sources: Labour Force Survey and Bank calculations.

- (a) Number of hours that the currently employed report that they would like to work, on average per week calculated from LFS microdata, which have been seasonally adjusted by Bank staff. Calculation based on Bell, D and Blanchflower, D (2013), 'How to measure underemployment?', *Peterson Institute for International Economics Working Paper No. 13-7*. Data available up to 2014 Q4.
- (b) The diamond shows Bank staff's projection for 2015 Q1, based on official data to February 2015.

hours without excess upward pressure on wages. Although the outlook for average hours is highly uncertain, equilibrium average hours are likely to fall gradually as the share of older people, who typically work shorter hours, increases.

### 3.2.3 Overall slack in the economy

Combining all the evidence, including top-down statistical estimates and bottom-up evidence on the components of supply, the MPC's best collective judgement is that slack in the economy is broadly in the region of ½% of GDP in 2015 Q2, having narrowed slightly from the previous quarter. But there is considerable uncertainty around the current degree of slack and its likely evolution, and there is a wide range of views on the Committee.

It is possible that there is more slack than in the central view. That would be consistent with weaker wage growth recently. And the potential for net inward migration could mimic the effects of slack in terms of its impact on wage pressures. If potential employees currently not resident in the United Kingdom, but available for work here, can search for jobs from overseas that could make wages less responsive to domestic labour market pressures. Consistent with this, the number of migrants arriving that already have a UK job has increased in recent years. Future migration flows are uncertain, however, and will depend, in part, on the availability of jobs in other EU countries.

Alternatively, it is possible that the current degree of slack is smaller than in the central view. And the absorption of slack could be associated with smaller increases in output than assumed — for example, if employment growth continues to be more concentrated in lower-skilled jobs with relatively low productivity.

The MPC will continue to monitor developments in potential supply and their implications for slack carefully.