

# How has the risk to inflation from inflation expectations evolved?

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During 2011, the Monetary Policy Committee expressed concern that persistently above-target outturns of CPI inflation might lead to inflation expectations becoming less well anchored by monetary policy. And in turn, that could make inflation itself more persistent via changes in price-setting or wage-setting behaviour. But inflation is now more than 2 percentage points lower than in September 2011. In light of that, this article discusses recent movements in inflation expectations and looks at a range of indicators to assess how the risk to inflation from expectations has evolved. While the upside risk has receded a little relative to the 2010–11 H1 period, so long as inflation is above target, some risk remains.

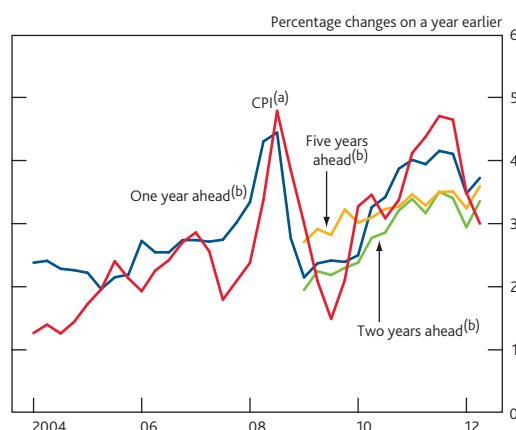
## Introduction

Inflation, as measured by the consumer prices index (CPI), has been more than 1 percentage point above the 2% target set by the Government for much of the past four years. That largely reflects the temporary effects of a range of factors: rising food and energy prices, changes in the standard rate of VAT and higher import prices following the substantial depreciation in sterling.

As inflation rose between 2010 and 2011 H1, the Monetary Policy Committee (MPC) became increasingly concerned that a continued period of above-target inflation might prompt households, companies and financial market participants to expect inflation to persist above the target. That might happen if individuals believed that the MPC had become more tolerant of deviations of inflation from target in the near term. Or if they had doubts about the ability, or willingness, of the MPC to return inflation to target in the medium term. Either would suggest that expectations of inflation had become less well anchored by the monetary policy framework. If inflation expectations were to become less well anchored, changes in price-setting or wage-setting behaviour, or both, may lead inflation itself to become more persistent. As a result, during 2011, the MPC judged there was an upside risk to inflation from inflation expectations.

Following its rise between 2010 and 2011 H1, CPI inflation has fallen from its peak of 5.2% in September 2011 to 3.0% in April 2012.<sup>(2)</sup> That fall has been accompanied by declines in some measures of households' inflation expectations (**Chart 1** and **Chart 5**). Companies' inflation expectations and financial market implied measures of future inflation have also fallen relative to the 2010–11 H1 period. The outlook for inflation is

**Chart 1** Inflation and survey measures of household inflation expectations



Sources: Bank/GfK NOP and ONS.

(a) The last data point is April 2012.

(b) Respondents to the Bank/GfK NOP survey are asked how much they would expect prices in the shops generally to change over the next one, two and five years respectively.

uncertain, but the MPC judges that inflation is likely to remain above target throughout 2012, before falling back during 2013 as the impact of spare capacity pulls down on inflation.<sup>(3)</sup>

This article analyses how the upside risk to inflation from inflation expectations has evolved over the past eight months relative to the 2010–11 H1 period. A previous article in the 2011 Q2 *Quarterly Bulletin* set out a framework for assessing the risk to inflation from inflation expectations.<sup>(4)</sup> This article applies that framework to recent developments, and is structured as follows. The first section assesses the extent to

(1) The author would like to thank Alice Pugh for her help in producing this article.

(2) This analysis was done before the release of the May 2012 CPI outturn.

(3) For the MPC's latest assessment of the outlook for inflation, see Section 5 of the May 2012 *Inflation Report*.

(4) See Macallan, O'Grady and Taylor (2011).

**Table A** Level of longer-term inflation expectations

	Time horizon	Start of data	Per cent				
			Series average	2010	2011 H1	2011 H2	2012 H1
<b>Surveys of households</b>							
Bank/GfK NOP	5 years	Feb. 2009	3.2	3.2	3.4	3.5	3.4
Barclays Basix	5 years	Aug. 2008	3.9	3.8	3.7	4.0	4.0
YouGov/Citigroup	5–10 years	Nov. 2005	3.4	3.3	3.6	3.6	3.4
<b>Surveys of professional forecasters</b>							
Bank	3 years	May 2006	2.0	2.0	2.1	2.1	2.1
HM Treasury	4 years	Mar. 2006	2.1	2.2	2.1	2.2	2.4
<b>Measures derived from financial instruments<sup>(a)</sup></b>							
Swaps	Five-year, five-year forward	Oct. 2004	2.5	2.7	2.6	2.5	2.5
Gilts	Five-year, five-year forward	Jan. 1996 <sup>(b)</sup>	2.4	2.8	2.9	2.3	2.4
<i>Memo:</i>							
CPI		Jan. 1996	2.1	3.3	4.3	4.7	3.4

Sources: Bank/GfK NOP, Barclays Capital, Bloomberg, Citigroup, HM Treasury, ONS, YouGov and Bank calculations.

(a) Financial instruments are linked to RPI inflation. The measures shown assume that market participants expect RPI inflation to be 0.8 percentage points higher than CPI inflation in the long term, around the average size of the difference between RPI and CPI over 1996–2012. But there is considerable uncertainty over financial market participants' estimates of that difference. That means that actual CPI expectations may differ from these figures. The average for 2012 H1 is taken as the average of daily prices between 1 January 2012 and 31 May 2012.

(b) The series for five-year, five-year forward RPI inflation derived from gilts, started in January 1985. But for the purpose of this table, the series average is taken over 1996–2012 to be consistent with the start of the CPI data.

which long-term and short-term expectations remain well anchored. The second section evaluates the latest evidence on the extent to which inflation expectations have affected wage and price-setting behaviour. The final section concludes.

## Assessing the extent to which expectations remain anchored

Inflation expectations could become less well anchored in two ways. First, households, companies and financial market participants may become less confident in the ability, or willingness, of the MPC to bring inflation back to target in the medium to long term. Second, they may perceive the MPC to have become more tolerant of deviations in inflation from target in the near term, and, therefore, expect inflation to return towards the target more slowly. The former would be signalled by changes in longer-term expectations, and the latter would be reflected in shorter-term measures. This section therefore reviews movements in both longer-term and shorter-term expectations over the past eight months to assess how the upside risk to inflation from inflation expectations has evolved relative to 2010–11 H1.

### Longer-term expectations

If inflation expectations were to become less well anchored to the inflation target in the longer term, then this might become evident in at least one of three ways: the level of inflation expectations might deviate from target; inflation expectations might become more responsive to developments in the

economy; and uncertainty around expected future inflation might increase.

If the level of longer-term inflation expectations deviates far from the inflation target, it might indicate that individuals have less confidence in inflation coming back to target in the long term. The MPC monitors a range of measures of longer-term inflation expectations, including expectations taken from surveys of households, forecasts by professional economists, and estimates derived from inflation-indexed instruments in financial markets.<sup>(1)</sup> The annex describes these available survey measures in more detail.

The level of longer-term inflation expectations appears to suggest that the upside risk from longer-term expectations has not crystallised (Table A). All measures of longer-term expectations are either at, or just above, their series averages.<sup>(2)</sup> But the household surveys have relatively short backruns of data: for two of the surveys, the series averages are calculated over a period when inflation had been well above target. Perhaps more reassuring, inflation expectations as measured by the YouGov/Citigroup survey (which goes back further) are in line with their series averages. While inflation expectations have fallen or stayed the same for many of these measures, two of the measures have risen slightly relative to the 2010–11 H1 period.

A second way to gauge the extent to which longer-term expectations are well anchored is to test the responsiveness of these measures to developments in the economy. In an environment of well-anchored expectations, news in economic variables such as CPI, RPI, GDP and industrial production, should not affect individuals' expectations of inflation in the long term. But if inflation expectations were to become less well anchored, then they might become more responsive to news in such data.<sup>(3)</sup> Moreover, longer-term inflation expectations might also become more closely correlated with shorter-term expectations if individuals believed that factors affecting inflation in the short term would also have an effect on inflation in the long term.<sup>(4)</sup>

In financial markets, there are few signs that implied measures of longer-term expectations have become more responsive to developments in the economy over the past eight months. Between 2004 and 2007, when inflation had been close to target, longer-term measures of expectations tended to respond very little to news in CPI, RPI, GDP and industrial

(1) Companies' inflation expectations are not available beyond the one-year horizon.

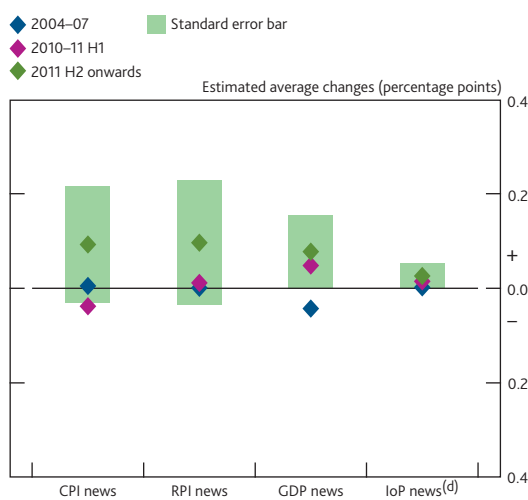
(2) But as discussed in Macallan, O'Grady and Taylor (2011), there are uncertainties around all of these indicators. For example, none of the surveys of households reference a specific inflation measure. It is therefore not clear what measure of inflation households have in mind when answering the question. And estimates derived from financial market instruments may be influenced by market-specific factors, such as liquidity or demand from pension funds for index-linked cash flows. See McGrath and Windle (2006).

(3) See Gürkaynak, Levin and Swanson (2006).

(4) But changes in the correlation might also reflect variations in liquidity in the markets for short and long-maturity instruments.

production on the day of the publication of the data. That remained the case during 2010–11 H1 and over the past eight months (Chart 2). While the responsiveness of five-year, five-year forward inflation to news has increased a little in the most recent period, it is statistically insignificant.<sup>(1)</sup> These estimates are, however, based on small sample sizes and hence there are large uncertainties around them, as indicated by the standard error bars on the chart. The bars cover two standard errors on either side of the regression coefficients estimated over the 2011 H2 to current period.

**Chart 2** Estimated average changes in five-year, five-year forward inflation derived from swaps in response to economic news<sup>(a)(b)(c)</sup>



Sources: Bloomberg, ONS and Bank calculations.

- (a) Average changes are the estimated slope coefficients from regressions of the change in five-year, five-year forward rates on news in the various economic releases, on the day on which the data were published.  
 (b) News is defined as the difference between the ONS data outturn and the Bloomberg median forecast. For CPI, RPI and IoP, news is based on monthly data outturns. For GDP, news is based on quarterly data outturns.  
 (c) The bars cover two standard errors on either side of the estimated slope coefficients over the 2011 H2 to current period.  
 (d) Index of Production (IoP). This is the ONS release for industrial production.

Although it is easier to isolate the impact of news on measures of inflation expectations derived from financial markets — as these are available on a daily frequency — the Bank/GfK NOP household survey can also be used to assess the responsiveness of longer-term inflation expectations to CPI news. The sample size of the Bank/GfK survey is boosted in February each year by carrying out the survey in two waves. For the past two years, the first wave has been conducted before the ONS's release of the January inflation outturn, and the second after it. That provides a way to test the responsiveness of households' longer-term inflation expectations to CPI news: changes in households' perceptions of inflation between the two waves are likely to be, in part, related to news in CPI inflation for households.

The annual inflation outturn fell from 4.2% in December 2011 to 3.6% in January 2012, in line with financial market participants' expectations. But households' perceptions of inflation picked up between the two waves in the

February 2012 survey. And five year ahead expectations rose by the same amount as inflation perceptions between the two waves (Table B). That may suggest that households were surprised by the strength of the January CPI release, and that they revised up their longer-term expectations in response to news in actual inflation. But there are many other factors affecting households' inflation expectations. For example, households may have been reacting to movements in food and energy prices in the shops. At the time of the February 2011 survey, the inflation outturn had increased from 3.7% in December 2010 to 4% in January 2011, in line with financial market participants' expectations. Households' perceptions of inflation picked up between the two waves of this survey, although longer-term inflation expectations fell. To sum up, longer-term inflation expectations were positively correlated with inflation perceptions in the two waves of the February 2012 survey. And expectations were negatively correlated with inflation perceptions in the February 2011 survey. But it is hard to assess whether this change in responsiveness of households' inflation expectations is significant as the analysis presented here is based only on two years' worth of data.

**Table B** Median household inflation expectations in the first and second survey waves of the Q1 Bank/GfK NOP survey

	Inflation perceptions <sup>(a)</sup>		One year ahead <sup>(a)</sup>		Five years ahead <sup>(a)</sup>	
	Wave 1	Wave 2	Wave 1	Wave 2	Wave 1	Wave 2
Feb. 2012 <sup>(b)</sup>	4.7	4.9	3.4	3.6	3.1	3.3
Feb. 2011 <sup>(c)</sup>	4.3	4.5	3.9	4.1	3.6	3.3

Source: Bank/GfK NOP.

- (a) The survey asks households how prices in the shops generally have changed over the past twelve months and how they expect them to change over the next one, two and five years, respectively.  
 (b) The February 2012 survey was conducted between 9–21 February, with the first wave being conducted between 9–14 February and the second wave being conducted after the CPI release on 14 February.  
 (c) The February 2011 survey was conducted between 10–22 February, with the first wave being conducted between 10–15 February and the second wave being conducted after the CPI release on 15 February.

Finally, uncertainty around expected future inflation might rise if individuals become less certain about how the MPC will react to current or future developments in the economy that push inflation away from target. That said, this may not necessarily indicate that inflation expectations are less well anchored: uncertainty could also rise if individuals change their views about the size and persistence of shocks that are likely to affect the economy in the future.

Uncertainty can reveal itself in one of two ways: greater uncertainty for any one individual about the range of possible outcomes, or greater disagreement across individuals about what inflation is likely to be.<sup>(2)</sup> Different indicators can be used to monitor each type of uncertainty. Measures of dispersion across surveys of households and companies provide evidence on the range of views across individuals, but cannot capture individual uncertainty. The Bank of England's

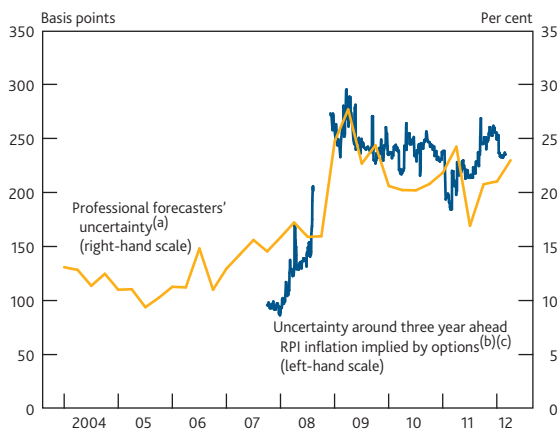
(1) The results are similar for the reaction of implied measures of long-term inflation expectations derived from gilts, rather than swaps.

(2) For more on uncertainty and disagreement, see Boero, Smith and Wallis (2008).

survey of external forecasters provides evidence on individual uncertainty, because it asks each forecaster to attach specific probabilities to a range of different outcomes for future inflation. It also contains information about the range of views across market participants. And option prices, which can be used to estimate the weight that market participants collectively attach to different future inflation outcomes, are likely to contain information about both.

Uncertainty around professional forecasters' longer-term inflation expectations was broadly stable during 2004–07 when CPI inflation had been close to target (Chart 3).<sup>(1)</sup> But between 2008 and 2011 H1, there was a significant rise in both professional forecasters' and option-implied uncertainty around future inflation. And both these measures have remained elevated over the past eight months. But that does not necessarily mean that individuals doubt the MPC's ability to bring inflation back to target. The volatility in inflation over the past few years may have led individuals to reassess their expectations of shocks to future inflation.<sup>(2)</sup>

**Chart 3** Uncertainty around inflation in the medium term for professional forecasters and financial market participants



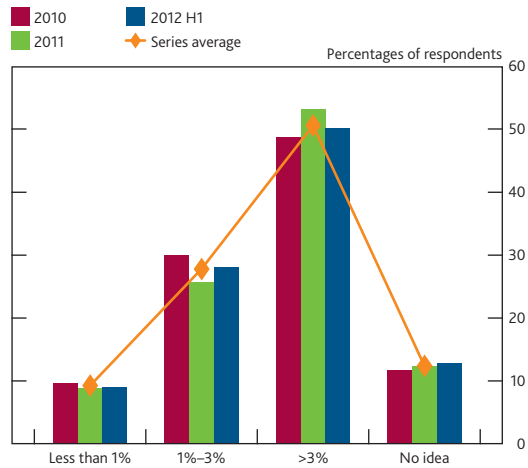
Sources: Bank of England, Bloomberg and Bank calculations.

- (a) Professional forecasters' uncertainty is calculated as the average probability that inflation will be more than 1 percentage point away from target. Calculated from the probability distributions for inflation in the medium term reported by forecasters responding to the Bank's survey. Forecasters reported probability distributions for CPI inflation two years ahead between February 2004 and February 2006; and for CPI inflation three years ahead from May 2006 onwards.
- (b) Standard deviation of the probability distribution of annual RPI outturns for three years ahead implied by options.
- (c) For technical reasons relating to the very low level of RPI inflation between November 2008 and February 2009, it is not possible to construct a full set of probability distributions for that period.

While dispersion across households cannot capture individual uncertainty, changes in the distribution of longer-term expectations might shed light on how the upside risk from inflation expectations has evolved over the past eight months. The YouGov/Citigroup survey, which is the longest-running survey of households' longer-term inflation expectations, suggests that the upside risk from inflation expectations appears to have receded a little in the past eight months. According to the survey responses, the proportion of households who think that inflation will be above 3% has

fallen a little (Chart 4). And for the Bank/GfK NOP and Barclays Basix surveys, the proportion of households who expect inflation to be greater than 3% has remained broadly constant, and in line with their series averages.

**Chart 4** Distribution of households' inflation expectations in the long term<sup>(a)(b)</sup>



Source: YouGov/Citigroup.

- (a) The YouGov/Citigroup survey started in November 2005 and is the longest-running survey of households' longer-term inflation expectations.
- (b) The survey asks households how they expect consumer prices of goods and services to develop over the next five to ten years.

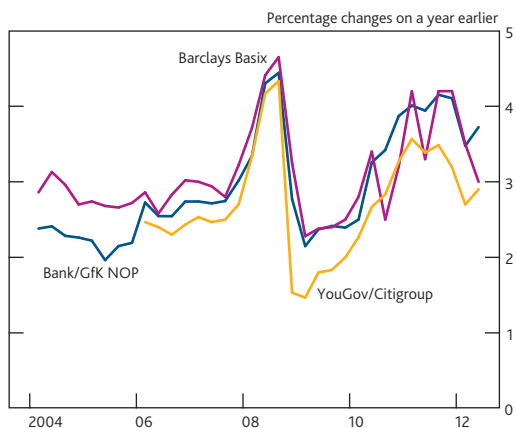
### Shorter-term expectations

Even if longer-term expectations remain anchored, people might believe that it will take the MPC longer to get inflation back to target following a temporary deviation from target. That might manifest itself in at least one of three ways: movements in short-term inflation expectations may not be consistent with developments in the economy; individuals might place less weight on the target while forming expectations; and short-term inflation expectations might become more responsive to news.

Near-term inflation expectations have fallen across a range of measures relative to the 2010–11 H1 period. Households' near-term expectations are much lower than their 2011 peaks (Chart 5). And this has been accompanied by a fall back in companies' expectations as well (Chart 10). An indicator of the extent to which these short-term inflation expectations are well anchored is to test whether movements in inflation expectations are warranted by other developments in the economy. For example, inflation expectations could rise/fall due to a marked rise/fall in economic activity. While forming their forecasts for inflation, the MPC take into account the determinants of inflation. Therefore, one approach is to compare movements in inflation expectations with the MPC's own forecast for one year ahead inflation.

- (1) Option price data are not available prior to 2008 and therefore it is hard to say what level of uncertainty is consistent with inflation expectations being well anchored.
- (2) Moreover, inflation option-implied uncertainty is likely to have been amplified by financial market participants' desire for protection against extreme inflation outcomes.

**Chart 5** Households' one year ahead inflation expectations<sup>(a)</sup>

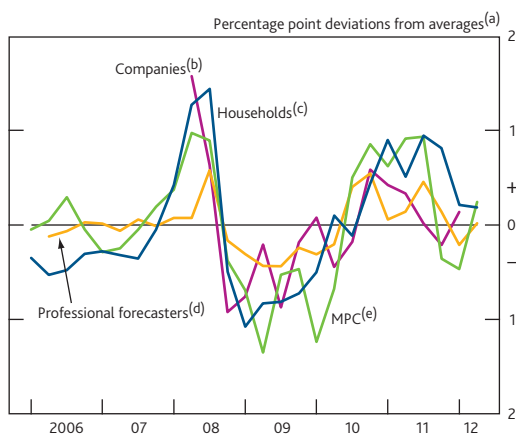


Sources: Bank/GfK NOP, Barclays Capital, Citigroup and YouGov.

(a) See the annex for the precise questions asked in these household surveys.

During the 2010–11 H1 period, one year ahead inflation expectations rose across a range of measures but the movements in these expectations were closely correlated with movements in the MPC's own one year ahead forecast. The fall in households' and professional forecasters' one year ahead inflation expectations also appear to be broadly in line with the downward revisions to the MPC's forecast, from Autumn 2011 to 2012 Q2 (Chart 6). Companies' inflation expectations, as measured by the expected average change in the general level of prices, have also fallen relative to the peak in the series in the 2010–11 H1 period.

**Chart 6** MPC's one year ahead forecast and inflation expectations for a year ahead



Sources: Bank/GfK NOP, Bank of England, Barclays Basix, Citigroup, Confederation of British Industry (CBI) and YouGov.

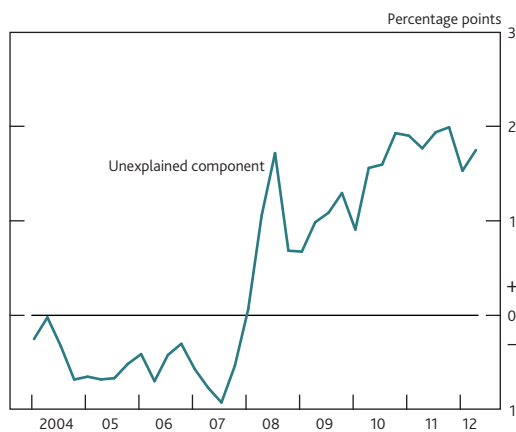
- (a) Averages from 2006 Q1 for households. Averages from 2006 Q2 for professional forecasters and from 2008 Q2 for companies. Averages from 2004 Q1 for MPC forecasts.
- (b) Companies — CBI data for the manufacturing, business/consumer services and distribution sectors, weighted together using nominal shares in value added. Companies are asked about the expected percentage price change over the coming twelve months in the markets in which they compete.
- (c) Households — based on averages of expectations for inflation from the Barclays Basix, Bank/NOP and YouGov/Citigroup surveys. These surveys do not reference a specific price index and are based on the median estimated price change.
- (d) Professionals — based on expectations of CPI inflation from the Bank of England survey.
- (e) The MPC measure is based on modal projections under market interest rates.

An alternative approach to gauge whether movements in shorter-term expectations are consistent with developments

in the economy is to use a statistical model, such as a structural vector autoregression (SVAR). The SVAR approach involves estimating a system of equations where each variable is regressed on past movements of itself and other variables in the model. That can then be used to decompose changes in each variable into an 'explained' component and an 'unexplained' component, under specific identifying assumptions. The 'explained' component of the inflation expectations equation can be thought of as the component that can be explained by past outturns of all variables in the model, in this case inflation expectations, GDP, wages, CPI inflation, Bank Rate and real oil prices. And the 'unexplained' component can be thought of as shocks to inflation expectations that cannot be explained by these factors.<sup>(1)</sup>

While the unexplained component of the model has fallen slightly relative to the 2010–11 H1 period, it remains positive (Chart 7). That suggests that one year ahead expectations have been higher than can be explained by variables in the model. To the extent that this persists, it might suggest that inflation may return more slowly towards the target than it otherwise would. Alternatively, the unexplained component might be picking up the effect of factors omitted from the model.

**Chart 7** SVAR model estimate of the unexplained component of one year ahead inflation expectations<sup>(a)(b)</sup>



Sources: Bank/GfK NOP, Barclays Basix, Bloomberg, ONS and Bank calculations.

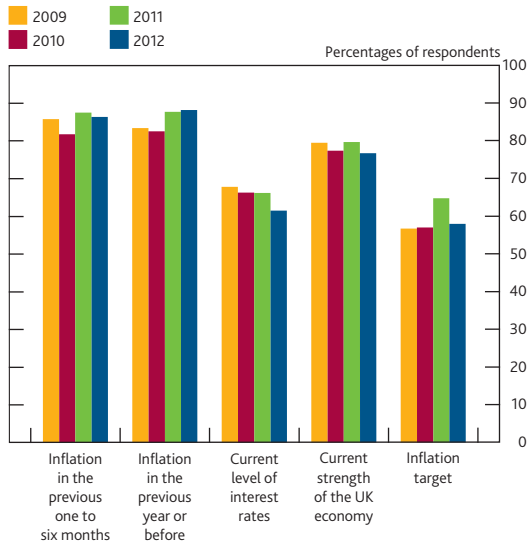
- (a) The SVAR model includes: CPI inflation, GDP growth, Bank Rate, wages, real oil prices and one year ahead inflation expectations. The model is estimated using data from 1987 Q3 to 2012 Q2. The inflation expectation series is based on the Barclays Basix estimate until 2009 Q4 and the Bank/GfK estimate from 2010 Q1 onwards. The Bank/GfK measure has been spliced to abstract from the recent volatility in the Barclays Basix measure.
- (b) With thanks to James Cloyne, who helped with this analysis.

A second way to gauge if shorter-term inflation expectations had become less well anchored, is to test if individuals were placing less weight on the inflation target while forming their expectations. The Bank/GfK NOP survey asks households which factors are important in forming their one year ahead expectations of inflation. The latest survey suggests that households continue to take account of a range of factors.

(1) For a fuller explanation of how inflation expectations shocks can be identified using an SVAR, see Barnett, Groen and Mumtaz (2010).

Although the proportion of households putting weight on the inflation target is less than those putting weight on other factors, it has remained fairly constant over time (Chart 8).

**Chart 8** Factors cited by households as important when forming their one year ahead inflation expectations<sup>(a)</sup>



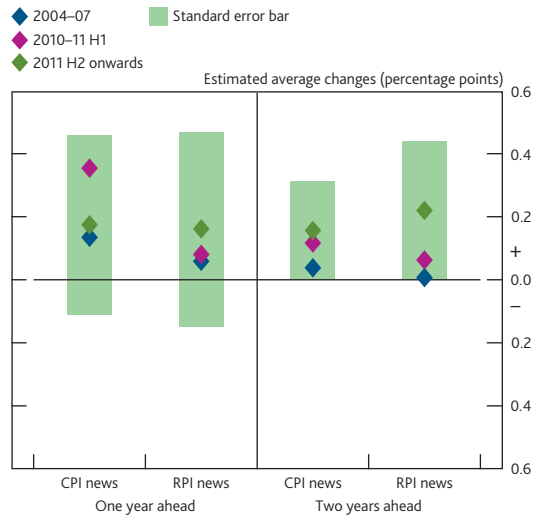
Source: Bank/GfK NOP.

(a) Respondents could select more than one option. The question is only asked in the extended survey.

Finally, if shorter-term inflation expectations were to become less well anchored, then, similar to long-term expectations, they might become more responsive to news in data such as CPI and RPI. Financial market implied measures of inflation expectations at the one-year horizon have become a little less responsive to CPI news over the past eight months but expectations have become more responsive at the two-year horizon (Chart 9). And expectations have become more responsive to RPI news at both the one and two-year horizons over the past eight months. But, as in the case of longer-term expectations, these differences are statistically insignificant.<sup>(1)</sup> They are also based on small sample sizes, so it is hard to conclude that responsiveness of near-term expectations has increased over the past eight months.

To conclude, it seems that the upside risk from longer-term inflation expectations — a belief that the MPC is less able, or willing, to return inflation to target in the longer term — has not crystallised. Despite the elevated level of longer-term uncertainty, most measures of inflation expectations are either at, or just above, their historical averages. And the near-term element of the upside risk — a belief that the MPC has become more tolerant of deviations of inflation from target — appears, if anything, to have receded a little. Shorter-term expectations have fallen over the past eight months and the inflation target continues to be an important factor in forming households' inflation expectations. But despite the tick down in the unexplained component of one year ahead inflation expectations, estimated using a SVAR, it remains positive.

**Chart 9** Estimated average changes in instantaneous forward inflation rates derived from swaps in response to CPI and RPI news<sup>(a)(b)(c)</sup>



Sources: Bloomberg, ONS and Bank calculations.

- (a) Average changes are the estimated slope coefficients from regressions of the change in instantaneous forward inflation rates at each horizon on news in the CPI and RPI releases, on the day on which the data were published.
- (b) News is defined as the difference between the ONS data outturn and the Bloomberg median forecast.
- (c) The bars cover two standard errors on either side of the estimated slope coefficients over the 2011 H2 to current period.

And some risk remains so long as inflation remains above target.

## Assessing price and wage-setting behaviour

If inflation expectations were to become less well anchored, inflation itself might become more persistent. That might materialise through changes in price or wage-setting behaviour, or both. Against the backdrop of declines in some measures of inflation expectations over the past eight months, this section assesses the extent to which past inflation expectations have fed, or are feeding through, into prices and wages. While evidence on price and wage-setting behaviour is limited, this section looks at the range of available indicators.

### Price-setting behaviour

If companies' inflation expectations were to become less well anchored, that might lead to changes in price-setting behaviour, and result in inflation being persistently away from target. For example, if companies think that inflation will be higher in the future, they might raise the price of their own goods and services by more than they otherwise would.

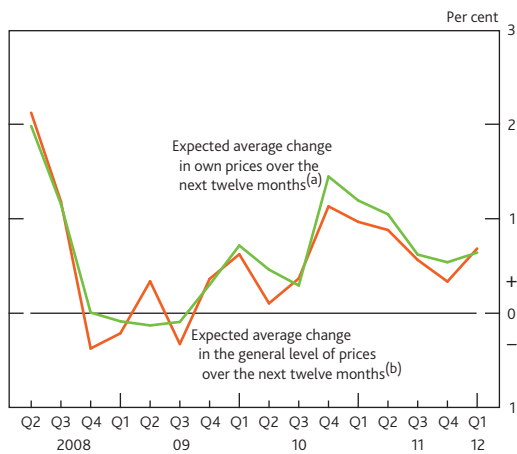
Indicators of companies' pricing intentions are limited. Surveys of businesses, such as those conducted by the British Chambers of Commerce (BCC) and Confederation of British Industry (CBI), are the main source of evidence. The CBI survey asks respondents how they expect their own output prices and

(1) The results are broadly similar when looking at the responsiveness to IoP and GDP news.

their competitors' prices to change over the next twelve months. And the BCC survey asks respondents about their price expectations over the next three months.

Survey estimates show that companies expected their own prices and the general level of prices to rise only modestly and less than they did in 2010–11 H1. The CBI survey shows that the fall in companies' pricing intentions (as measured by their own price expectations) has been accompanied by a fall in companies' general inflation expectations (as measured by the expected average change in the general level of prices) since 2010 (Chart 10). And the net percentage balance of companies in the BCC survey expecting to raise their own prices in the following three months has also fallen over the same period (Chart 11).

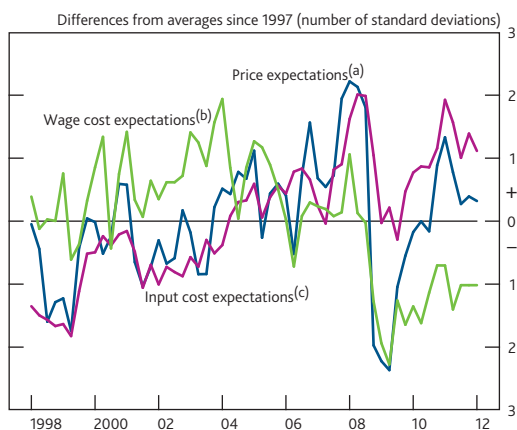
**Chart 10** Companies' expected changes to prices over the next twelve months



Sources: CBI and ONS.

- (a) Companies are asked: 'What percentage change is expected to occur over the next twelve months in your own average output price for goods sold into UK markets?'.  
 (b) Companies are asked: 'What percentage change is expected to occur over the next twelve months in the general level of prices in the markets that you compete in?'.

**Chart 11** BCC survey measures of companies' price expectations versus cost expectations



Sources: BCC, ONS and Bank calculations.

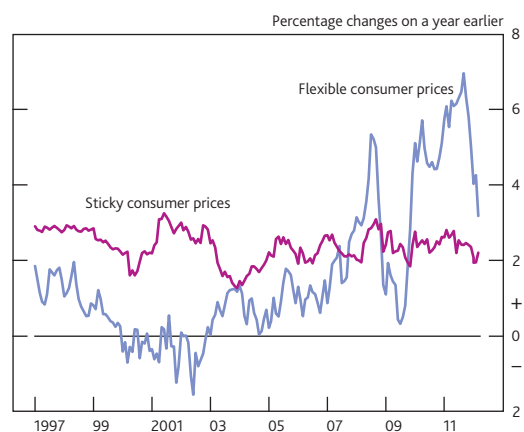
- (a) The exact question on price expectations is 'Over the next three months, do you expect the price of your goods/services to: increase/remain the same/decrease?'.  
 (b) The exact question on wage cost expectations is 'Is your business currently suffering pressures to raise prices from pay settlements?'.  
 (c) The exact question on input cost expectations is 'Is your business currently suffering pressures to raise prices from raw material prices?'.

It is hard, however, to assess whether there has been a causal link from companies' general inflation expectations to their own pricing intentions. For example, companies may plan to increase prices because they have experienced higher non-wage costs, like import prices, and they might expect competitors to do the same. That would not necessarily signal that inflation expectations had led to a rise in pricing intentions.

One way to isolate the impact of inflation expectations on companies' price-setting behaviour from other factors like input costs is to assess the extent to which firms are seeking to raise prices relative to those input costs. Responses to the BCC survey suggest that the net balance of respondents expecting prices to rise is above its long-run average (Chart 11). But the net balance of respondents expecting prices to rise is less than those who are facing increased pressure to raise prices from higher raw material prices. That could suggest that above-average price expectations are being driven by higher raw material prices, rather than less well-anchored inflation expectations.

An alternative way to assess how companies' inflation expectations are affecting price-setting is to look at the rate of inflation of goods and services in sectors that change their prices infrequently. If a company changes its prices only once in a while, then the prices that it sets are more likely to depend on its expectations for future inflation. That means that changes in the prices of these 'sticky price' goods and services might provide some information about companies' expectations of future inflation.<sup>(1)</sup> The average inflation rate

**Chart 12** Inflation in sticky and flexible price sectors<sup>(a)</sup>



Sources: ONS and Bank calculations.

- (a) The CPI basket is divided into twelve subcomponents, based on the classification of individual consumption according to purpose categories. These twelve subcomponents were divided between flexible and sticky price sectors based on the frequency at which the prices of different types of goods and services change. These frequencies were calculated from the price quotes that underpin the monthly CPI, which the ONS makes available to researchers via its secure Virtual Microdata Laboratory (described in Ritchie (2008)). The flexible price sector comprises those components of the basket in which prices on average change more regularly than the median frequency and the sticky price sector comprises those components of the CPI basket in which prices on average change less often than the median frequency. This method is described in more detail in Bunn and Ellis (2011). The sticky price series excludes utility prices, which are more likely to be changed due to changes in gas and other commodity prices rather than developments in the wider economy. Both the flexible and sticky price series include the impact of VAT.

(1) For more information about this method see Bryan and Meyer (2010).

of goods and services with sticky prices had remained broadly stable during the 2010–11 H1 period, and in the past eight months. Moreover, it remains close to 2%, its average level since 1997. That may indicate that companies do not expect inflation to remain above target (Chart 12).

To conclude, companies' inflation expectations and pricing intentions have fallen over the past eight months. But it is hard to know for sure whether or not past rises in companies' expectations have affected price-setting behaviour.

### Wage-setting behaviour

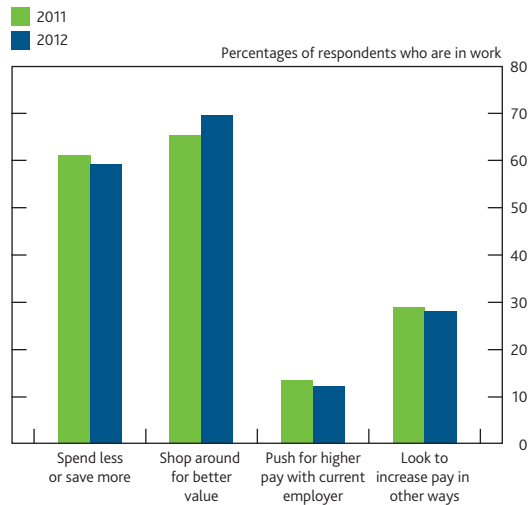
This section assesses the extent to which higher inflation expectations in the past have fed into wage-setting behaviour. Inflation expectations may affect wage-setting in one of two ways. First, if households expect higher inflation, they might push for higher wages. And an increase in labour costs might put pressure on companies to raise prices. Second, if companies expect higher prices in the future, they might be willing to grant higher wages, in particular, if they thought that an erosion in real wages may affect their ability to retain and mobilise their workforce. Higher wages might then in turn create further inflationary pressure by boosting spending. Inflation expectations are not the only factor affecting wages, however. For example, companies may pay higher wages if employees become more productive. Or a fall in unemployment might push up wages because it reduces the pool of employees a company can look to use in place of their current employees.

Surveys of households and companies may help to isolate the impact of inflation expectations on wages. For example, the Bank/GfK NOP survey asks households whether they are planning to push for higher pay with their current employer in light of their inflation expectations. And the CBI survey asks companies if they are likely to increase wages on account of higher inflation expectations. The Bank/GfK NOP survey continues to suggest that a low proportion of households are pushing for higher pay in light of their inflation expectations (Chart 13).

According to the CBI survey, companies do not appear to have become more willing to pay higher wages because they expect to be able to recoup those costs by raising prices. If companies expected above-target inflation to persist and were therefore more willing to allow higher wages, then that might result in a high correlation between changes in companies' expectations of own prices and general prices and changes in their expectations of wage costs in the data. Over the past year, the correlation between companies' price expectations and wage expectations continues to be weak, as in the 2010–11 H1 period (Chart 14) and has dropped further in the latest survey.

To conclude, private sector wage growth continues to be weak.<sup>(1)</sup> This could be accounted for by factors other than

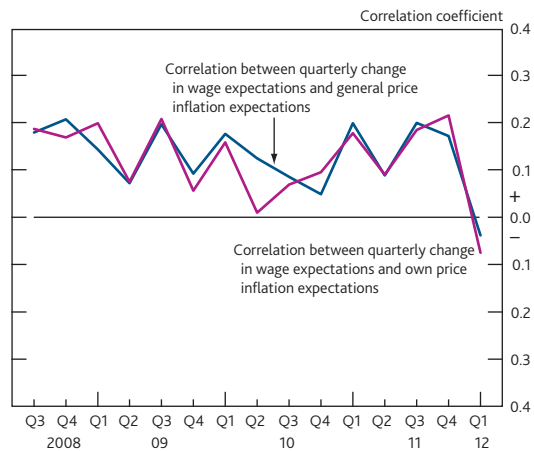
**Chart 13** Working households' planned actions in light of their short-term inflation expectations<sup>(a)</sup>



Source: Bank/GfK NOP.

(a) Respondents to the Bank/GfK survey were asked which actions they are taking, or planning to take, in light of their expectations of price changes over the next twelve months. The list included four actions in addition to those shown on the chart: bring forward major purchases; move savings out of banks or building societies into other assets such as shares, bonds, housing or gold; other (unspecified); and take no action. Respondents could select up to three actions.

**Chart 14** Correlation between changes in companies' wage expectations and their price expectations



Sources: CBI (all rights reserved) and Bank calculations.

inflation expectations like labour market slack and/or weak productivity.<sup>(2)</sup> But there is little evidence that households have been pushing up wage demands in response to elevated inflation expectations, or that firms have been more willing to grant them.

### Conclusion

During 2011, the MPC became increasingly concerned that a sustained period of above-target inflation might lead inflation

(1) For a fuller discussion of the factors driving wage growth, see the May 2012 *Inflation Report*.

(2) For descriptive analysis of the recent weakness in UK labour productivity, see Hughes and Saleheen (2012).



expectations to become less well anchored to the target. In turn, this could make inflation itself more persistent via changes in price-setting or wage-setting behaviour. At that time, the MPC judged that there was an upside risk to inflation from inflation expectations.

Over the past eight months, inflation has fallen by more than 2 percentage points relative to its 2011 peak. And, on balance, the indicators discussed in this article suggest that the upside risk from inflation expectations may have receded a little relative to Autumn 2011.

The upside risk from longer-term expectations appears to have not crystallised. Despite the elevated level of longer-term uncertainty, most measures of inflation expectations are either at, or just above, their historical averages.

The near-term element of the inflation expectations risk appears, if anything, to have receded a little. Shorter-term expectations have fallen over the past eight months and the inflation target continues to be an important factor in forming households' inflation expectations. But while the unexplained component of one year ahead inflation expectations, estimated using an SVAR, has fallen slightly relative to the 2010–11 H1 period, it remains positive.

There are also few signs that past inflation expectations have fed into wages. And while companies' inflation expectations have fallen over the past few months, it is hard to know for sure whether or not past rises in these expectations have affected price-setting behaviour.

Nevertheless even if it is diminished, the upside risk from inflation expectations remains so long as inflation remains above target.

## Annex

### Available indicators of inflation expectations

	Time horizons	Start of data	Survey question/measure of inflation
<b>Surveys of households</b>			
Bank/GfK NOP	1 year 2 and 5 years	Nov. 1999 Feb. 2009	How much would you expect prices in the shops generally to change over the next one, two and five years?
Barclays Basix	1 and 2 years 5 years	Dec. 1986 Aug. 2008	What do you expect the rate of inflation to be over the next twelve months and over the next five years?
YouGov/Citigroup	1 and 5–10 years	Nov. 2005	How do you expect consumer prices of goods and services will develop over the next 1 and 5–10 years, respectively?
<b>Surveys of companies</b>			
BCC	3 months	Feb. 1997	Over the next three months, do you expect the price of your goods/services to increase/remain the same/decrease?
CBI	1 year	Apr. 2008	What percentage change is expected to occur over the next twelve months in the general level of prices in the markets you compete in?
<b>Surveys of professional forecasters</b>			
Bank	1, 2 and 3 years	May 2006	Point forecasts for CPI.
HM Treasury	1, 2, 3 and 4 years	Mar. 2006	Point forecasts for CPI.
Consensus	5–10 years	Oct. 2004	Point forecasts for CPI.
<b>Measures derived from financial instruments</b>			
Swaps	1 to 50 years ahead	Oct. 2004	RPI-linked.
Gilts	1 to 50 years ahead	Jan. 1985	RPI-linked.

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