



BANK OF ENGLAND

Speech

Understanding Inflation: Expectations and Reality

Speech given by

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It is an honour to be here to give the Ronald Tress lecture. Ronald Tress pushed the frontier in economics by recognising the importance of data for the conduct of public policy. His vision was surely nurtured by his remarkably broad scholarship, as well as his years of experience in the War Cabinet, where he served from 1941 until 1947. He painstakingly worked on the construction of disaggregated labour and industry statistics. More than anyone, he would have recognised the critical role that technology could play in the process. Indeed, as Master of Birkbeck, one of his many legacies was to bring in the first electronic computer to the University of London.

In the spirit of linking data and policy, today I will talk about inflation, the key element in our policy remit. And more specifically, I will focus on the disconnect in the data between the facts (what inflation has actually been) and what households perceived it – or expected it – to be. What is behind this disconnect and what should be done about it?

I would like to emphasise four points.

- Since the Bank of England's independence in 1997, CPI inflation has averaged 2%. (It was 2.0% in May 2019, the latest reading.)
- Households' perceptions and expectations of inflation have averaged well above our target, with huge dispersion across different demographic groups. Moreover, a significant fraction of people simply do not know what inflation is or might be – a pattern that appears to be particularly prevalent among households with lower income and education.
- Higher inflation expectations in principle reduce the incentive to save for the future, increasing current spending. It is less evident how not knowing what inflation is or might be affects individual behaviour. While bridging the gap between reality and expectations may not have a material macroeconomic impact, it could certainly improve the decision-making of uninformed households. The challenge is not just one for central bank communications as some of the differences in perceptions and expectations may relate to varying degrees of financial literacy.
- The Bank of England has made significant efforts to improve its communications and educational outreach. The MPC, for example, now publishes a visual summary of the Inflation Report, which aims to be accessible to a broad audience. The Bank has revamped its website and aims to speak in plain English as much as possible. And colleagues at the Bank have produced a set of lessons on the economy and how it relates to the individual, called *econoME*, which is part of a broader effort to raise economic and financial literacy. But there is certainly scope to do more, and for other organisations, like colleges and universities to join the effort.

Reality: inflation in the recent past

Since the Bank of England's independence in 1997, the Monetary Policy Committee (MPC) has been tasked with achieving price stability, as defined by the government's inflation target. The formation of the MPC was a further evolution of the UK monetary policy framework, following the adoption of an explicit inflation target in 1992. Since 2004, the target has been set as an inflation rate of 2%, measured by the 12-month increase in the Consumer Prices Index (CPI).¹

Before the mid-1990s, inflation was anything but low and stable (**Chart 1**). The average RPIX inflation rate from 1976 to 1992 was 8.5%, ranging between 3% and 24% (**Table 1**). Following independence and the adoption of inflation targeting, the behaviour of inflation changed markedly. Since 1997, CPI inflation has averaged 2% and inflation has stayed within a relatively narrow range around its target. Moreover, the largest misses can be partly attributed to volatile components such as food and energy prices. 'Core' CPI inflation, which excludes these components, has been even closer to 2% (**Chart 2**).

Table 1	Inflation rate (per cent/pp)		
	Average	Range	Volatility
Jan 1976 - Sep 1992 (RPIX)	8.5	20.5	4.8
Oct 1992 - May 1997 (CPI)	2.4	1.6	0.4
June 1997 - present (CPI)	2.0	5.3	1.1
<i>Memo: One-year-ahead inflation expectations*</i>	2.8	3.4	0.6

* Barclays Basix (June 1997 to present).

Chart 1: CPI and RPIX inflation

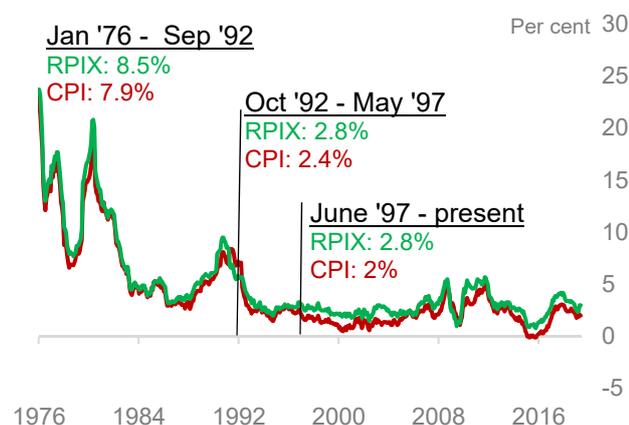
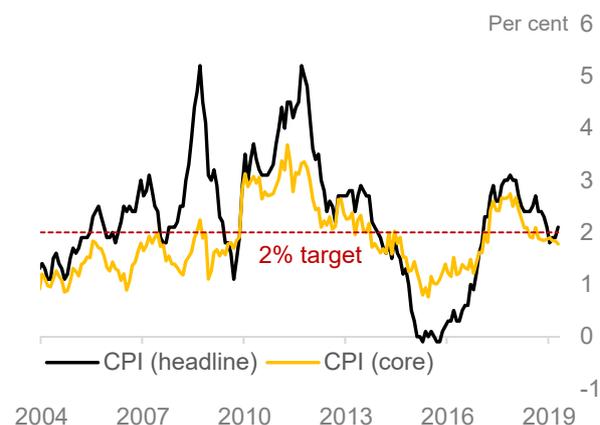


Chart 2: CPI and core CPI inflation



Source: ONS.

Notes: CPI data prior to 1996 are estimated. Core CPI is CPI excluding energy, alcohol, tobacco, food and non-alcoholic beverages.

The timing of the reduction in inflation was not coincidental. The framework changes helped address two related causes of the high and volatile inflation in the 1970s and 1980s. A clear remit to target inflation addressed the so-called time inconsistency problem: at any point in time, the temptation to unexpectedly

¹ From June 1997 until December 2003, the target was 2.5% annual inflation as measured by the Retail Prices Index excluding mortgage interest payments (RPIX).

overstimulate the economy, which once anticipated, leads to an inflationary bias.² And delegating decisions on interest rates to a committee (the MPC) in an independent central bank has helped insulate monetary policy from political influences. Specifically, the risk that the electoral cycle leads politicians to push for extra stimulus ahead of re-election, also creating a tendency towards volatile and above-target inflation.³

Both of these causes stem directly from the interaction between monetary policy and inflation expectations. When people expect that monetary policy will always tend towards providing extra stimulus, they will also expect inflation to increase in future. Higher expectations are likely to then feed into economic conditions today. If those higher expectations are slow to change, they can make it more costly to reduce inflation. Monetary policy may have to be tight for a long period of time, imposing significant costs in the form of lower activity and higher unemployment, before people lower their expectations.

The role of inflation expectations

People's expectations of future inflation are key influences on current inflation. As such, the MPC closely monitors a range of measures of inflation expectations. Understanding the causes and consequences of movements in those measures is of the utmost importance for policy decisions.

Indeed, a range of evidence supports the idea that the reduction in the level and volatility of inflation over the past forty years has come about in large part due to central banks' success in reducing inflation expectations. Inflation expectations affect people's decisions in several ways.⁴ In turn, these decisions influence everything from the amount of spending in the economy to the wages and prices set by companies. All of which directly or indirectly affect the current rate of inflation.

First, if households and companies expect prices to rise more quickly, they are likely to negotiate higher wage increases, and companies are more likely to set higher prices for their goods and services. Second, changes in inflation expectations in financial markets are likely to affect the nominal value of the exchange rate, affecting import prices and CPI inflation.

For both of these influences, it is likely to be the inflation expectations of firms and financial markets that matter more than those of households. Individual workers tend to have limited bargaining power in wage negotiations, so household expectations often play little direct role in wage-setting decisions. Perhaps as a result, many studies and discussions have tended to focus on the inflation expectations of companies,

² Kydland and Prescott (1977) and Barro and Gordon (1983). Monetary policy is also subject to another time inconsistency problem – that of stabilisation bias (see Woodford, 2003, for a discussion). This bias arises if policymakers may stabilise real activity by too much relative to inflation. If they could commit to stabilising real activity more slowly, then they would achieve better outcomes because expectations of future inflation would change in a beneficial way. But such a promise would no longer be the best thing to do once the future arrived – it would be time inconsistent.

³ Alesina (1987), Rogoff and Sibert (1988).

⁴ See Maule and Pugh (2013), for example, for a more detailed discussion of these channels.

professional forecasters and financial markets.⁵ This evidence, as well as a casual reading of the data, generally suggests a good understanding of the inflation process and of how monetary policy behaves.⁶

But third, for household spending decisions, household inflation expectations are likely to matter more. For a given level of interest rates, if households expect prices to rise more, that increases their incentive to spend today rather than saving. In other words, higher inflation expectations will reduce the real interest rate, boosting household consumption. The resulting rise in demand relative to supply will tend to push up on inflation.

In many of our economic models, this 'real interest rate channel' is extremely powerful. In reality, its effects may be mitigated somewhat by the many households who are unable to smooth their consumption across time.⁷ It may also be harder to identify at the relatively low rates of inflation that we now enjoy in the UK. Nonetheless, it is likely to be important for major purchases of durable goods such as houses or cars, especially at times when inflation expectations pick up markedly.

As a result, in addition to any potential effects on the economy, a good understanding of inflation is likely to be useful to households making major financial decisions. A key benefit of low and stable inflation is that it is more predictable. With effective communication, that should have made it easier for households to track, predict and act upon.

Public understanding of inflation and trust in monetary policy is also crucial for accountability. MPC members are unelected officials, chosen for their technical expertise, but ultimately accountable to the public. It is therefore crucial that we communicate our inflation target and our policy decisions accessibly to as wide an audience as possible.

Expectations: surveys of households

Since 1999, the Bank of England has conducted an inflation attitudes survey to track households' understanding of monetary policy issues.⁸ As part of that understanding, it includes various questions about households' inflation expectations. Specifically, it asks respondents how much they expect '*prices in the shops generally*' to change in the future, with the median response often taken as a summary measure. Households are asked their expectations for the next 12 months and for the longer term (five years ahead).

The MPC also monitors a range of other measures of inflation expectations. In recent outturns, professional forecasters' and companies' inflation expectations have remained close to or below their historical averages.

⁵ See Haldane (2017) and Reis (2018) for discussions.

⁶ Haldane (2017).

⁷ For example, some households may be unable to borrow enough to be able to consume much more than their current income, even if they know prices will rise in future.

⁸ See Bank of England (2001).

Financial market inflation expectations, in contrast, have increased slightly over the past few quarters, especially at longer horizons.

Households' short-term inflation expectations have been relatively stable recently, although they have increased since their recent lows in 2016, a period when CPI inflation itself had been close to zero (**Chart 3**).

Households' long-term inflation expectations have also picked up since 2016, with the Bank survey measure increasing to a series high of 3.8% in Q2 (**Chart 4**). The increase in the Bank survey in the latest datapoint has not been replicated in the other indicators, and there is some evidence that it partly reflects sampling volatility. But the general upward trend is evident across all three surveys since 2016, albeit from historically low levels. Part of the explanation may be that Brexit (more specifically its effect on sterling feeding through to realised CPI inflation) has increased some households' inflation expectations. I will come back to discuss a more nuanced effect of Brexit uncertainty on median expectations later in the speech.

Chart 3: One-year-ahead inflation expectations

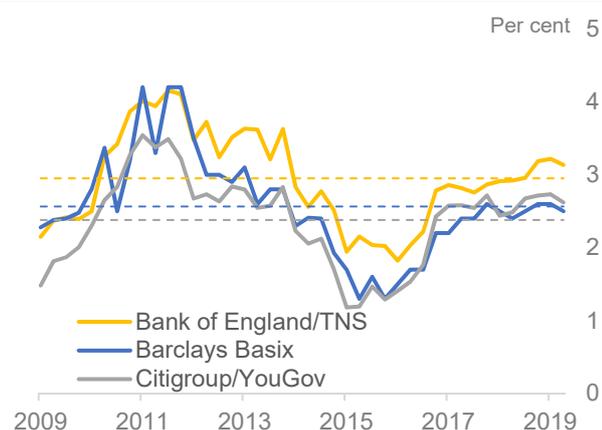
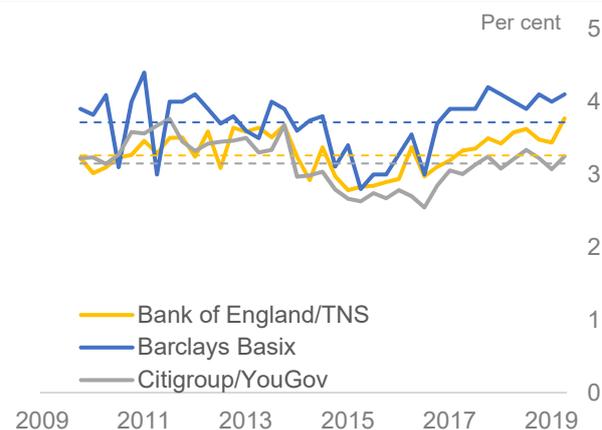


Chart 4: Long-term inflation expectations

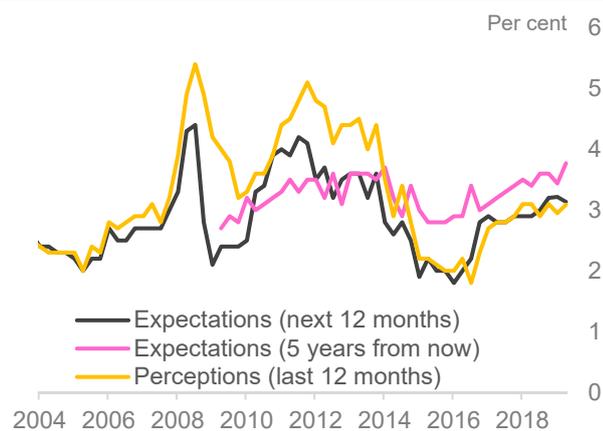
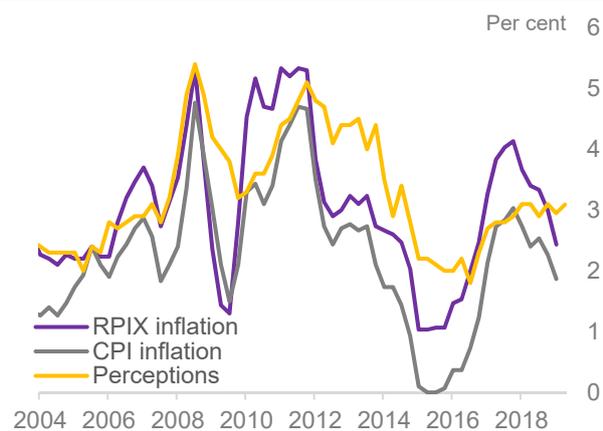


Sources: Bank of England/TNS, Barclays Basix, Citigroup/YouGov.

Notes: Long-term inflation expectations are five years ahead for Bank of England/TNS and Barclays Basix and five to ten years ahead for Citigroup/YouGov.

Households' inflation *expectations* are likely influenced by their inflation *perceptions*: what they think inflation currently is. So the Bank survey also asks households how they think prices have changed over the past 12 months. **Chart 5** shows that there is a fairly close relationship between perceptions of price rises over the past 12 months and expectations over the next 12 months, although less so with longer-term expectations.

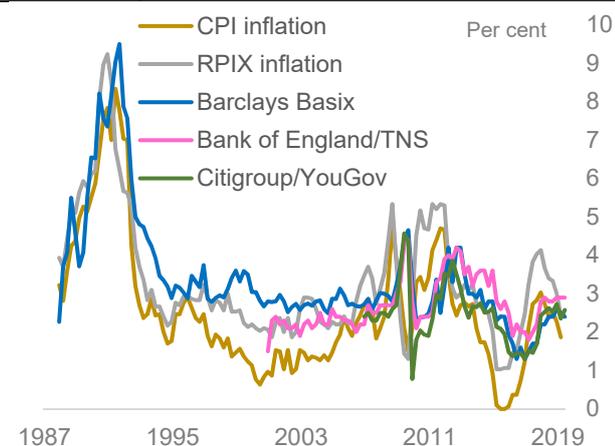
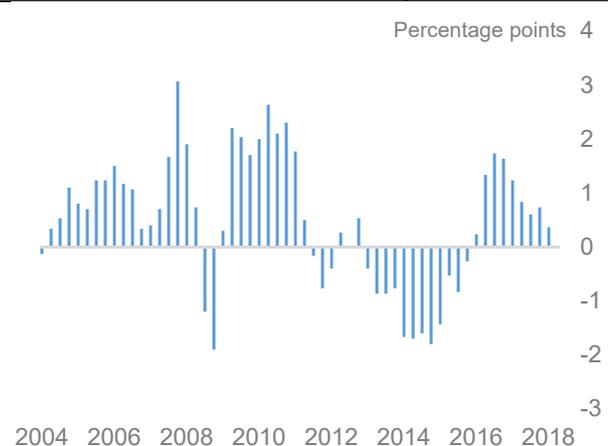
How do household perceptions of price rises compare to the measured CPI data? **Chart 6** shows that most households have perceived faster price rises than the actual change in CPI inflation, with the median perception around one percentage point higher on average over the period since 2004 (after the target had changed from RPIX).

Chart 5: Inflation perceptions and expectations**Chart 6: Inflation and inflation perceptions**

Sources: Bank of England/TNS and ONS.

Household expectations of future price rises are also generally higher than ex-post realised CPI inflation (**Chart 7**). This is true across surveys, and is perhaps unsurprising, given the close relationship between households' perceptions of inflation and their short-term expectations. It is also clearly evident in longer-term expectations.

That difference aside, median household inflation expectations have had mixed success in forecasting future inflation. **Chart 8** adjusts expectations in the Bank survey to take account of the average difference between household perceptions and actual rises in CPI. It then compares the adjusted, ex-ante forecast with ex-post realised inflation. The forecast errors show little remaining bias once expectations are adjusted. But the errors are somewhat large and persistent, suggesting that households do not always adjust their expectations even when prices start rising more quickly or slowly than they had expected.

Chart 7: Inflation and one-year ahead household inflation expectations**Chart 8: Adjusted one-year-ahead forecast errors on CPI inflation, Bank/TNS survey**

Sources: Barclays Basix, Bank of England/TNS, Citigroup/YouGov and ONS and Bank calculations.

Notes: Forecast errors are calculated as actual CPI inflation minus one year ahead inflation expectations, minus the sample average difference between household perceptions of past inflation and actual CPI inflation.

Why might households perceive (and expect) higher inflation than measured CPI? Since the survey question does not specify any particular price index, one possibility is that households are not referring to the same basket of goods and services. While the median household perception has been higher than CPI inflation since 2004, it has averaged around the same rate as RPI and RPIX inflation.⁹ RPI is no longer classed by the ONS as a national statistic, but it is still widely quoted in the media, and importantly, is used to uprate a range of highly visible items such as pensions, rail fares and student loans. It seems possible that despite the MPC's inflation target changing to CPI after 2003, households may have continued referring to RPI/RPIX when answering the survey question. If so, it would suggest an additional benefit to having a single, preferred measure of consumer prices.¹⁰

This is not the whole story, however. Compared to either price index, household perceptions and expectations fail to accurately track the observed volatility in the inflation data. The wider economics literature suggests at least three other sets of reasons why households may perceive inflation differently to the aggregate statistics: some psychological; some environmental; or some due to financial literacy.

The **psychological reasons** relate again to which prices respondents are referring to when they answer the question. The ONS's price indices are weighted according to average household spending patterns, but different households will consume different baskets of goods and services. There is no guarantee that even the median respondent faces the same basket as the CPI.

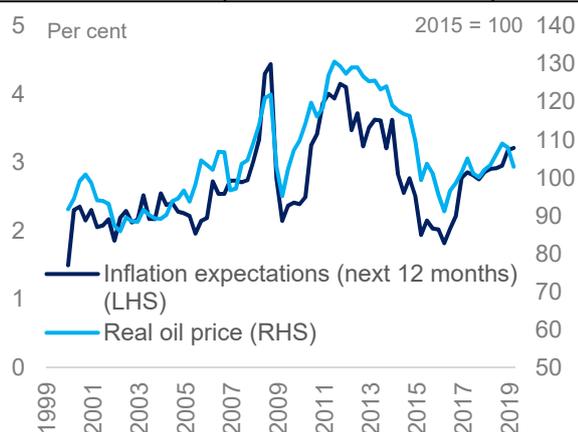
Even if they face the same consumption basket, households may show other cognitive biases when answering the question. Households may focus on more visible price changes such as energy and food. **Chart 9** shows that UK short-term inflation expectations closely follow petrol prices, a relationship also observed in other countries.¹¹ There is a similar correlation with food prices (**Chart 10**). Households may also recall personal experiences and place more weight on more salient events. There is evidence that large price changes are more memorable than small ones, and price increases more so than decreases. Similarly, people tend to remember recent and more frequent purchases more easily.¹²

⁹ RPI is the Retail Prices Index and RPIX is the Retail Prices Index excluding mortgage interest payments. RPI and RPIX inflation have differed at points since 2004, but have tracked each other closely since 2011.

¹⁰ The choice of the measure used as the monetary policy target is a decision of HM Government, and set out for the MPC in our Remit. The recent House of Lords Economic Affairs Committee (2019) report on 'Measuring Inflation' argued that 'it is confusing for the public to have multiple official measures of consumer price inflation in use.' The ONS have identified several issues with the RPI, including a 'formula effect' that creates an upward bias in measured RPI inflation and an inferior approach to measuring owner-occupied housing.

¹¹ See Coibion and Gorodnichenko (2015a) for the US.

¹² D'Acunto et al (2018).

Chart 9: Inflation expectations and real oil price**Chart 10: Inflation expectations and real food price**

Sources: Bank of England/TNS, ONS.

Notes: Real oil price is "fuels and lubricant" deflated by the CPI all items index; real food price is food and non-alcoholic beverages deflated by the CPI all items index.

The **environmental factor** relates to the aggregate level and volatility of inflation. In low-inflation countries, it is less important to know the rate of price inflation.¹³ When making financial decisions, it is more costly to ignore the effects of inflation when prices are increasing at 20% or 100% per year, relative to when they are increasing at only 2% per year. In the economics jargon, this is an example of *rational inattention*: the idea that attention is a scarce resource and is allocated to its best possible use. If inflation is not one of those uses, it may just reflect the success of the current framework in producing a low inflation environment. According to one opinion survey, less than 10% of people in the UK see inflation or prices as an important issue facing Britain today, compared to over 50% in the 1970s, when inflation was far higher.¹⁴

The final factor, which was previously discussed by my colleagues Andy Haldane (2017) and Ben Broadbent (2019), is **financial literacy**. This term is broadly understood as the skill to process economic information to make informed financial choices. It tends to be positively correlated with education and income.¹⁵ People who are more financially literate tend to have a better idea of what inflation is and, consequently, are able to make more informed consumption and saving decisions. Over the past three years, at least 15% of households have responded that they have 'no idea' how prices have changed, up from around 10% at the start of the decade, suggesting that this factor may be becoming more important.

To sum up, there are a number of reasons why household perceptions and expectations of price changes may differ from measured CPI data. It could be that households are referring to a different basket of goods and services, be it a different price index, or a subset of more visible goods. People may rationally opt not to process all the information required to form accurate perceptions and expectations because the benefits do

¹³ See Coibion and Gorodnichenko (2015b) for evidence of this. Cavallo, Cruces and Perez-Truglia (2017) find evidence for Argentina, Frache and Lluberas (2017) for Uruguay and Afrouzi *et al* (2018) for Iran.

¹⁴ Figures from the Ipsos MORI Issues Index, available at <https://www.ipsos.com/ipsos-mori/en-uk/issues-index-trends-1974-1987> and <https://www.ipsos.com/ipsos-mori/en-uk/brexit-continues-britains-biggest-concern-and-worry-over-pollution-and-environment-remains-high>.

¹⁵ Atkinson and Messy (2012); Lusardi and Mitchell (2014).

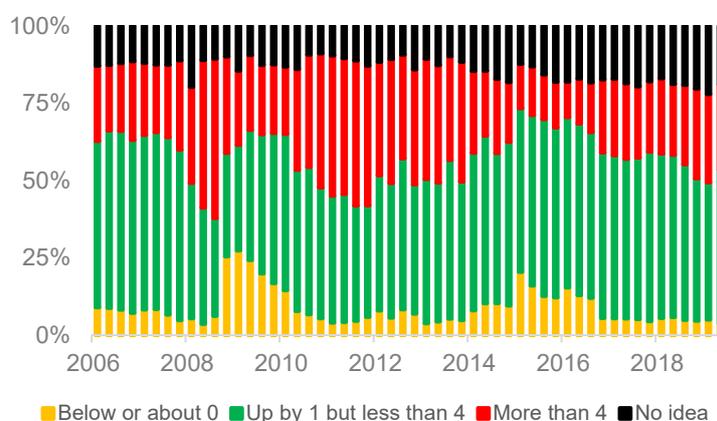
not justify the costs. Or it could be that different levels of financial literacy affect households' understanding of inflation. I next explore these possibilities by looking at disaggregated survey data.

Beyond the median: the distribution of households' inflation expectations

Do all households form expectations like the median? The short answer is no. Households' perceptions and expectations of inflation are highly dispersed.¹⁶ And some recent research has shown that this distribution may contain additional relevant information about the inflation process.¹⁷ Moreover, there are also large differences across demographic groups including gender, age and income.

Chart 11 shows the distribution of households' 12-month ahead inflation expectations in the Bank survey. It shows that there has consistently been a sizeable fraction of respondents who have expected prices to rise far faster than the Bank's 2% CPI inflation target. Since 2006, an average of one-third of the households who formed an expectation predicted inflation above 4%. In that period, measured CPI inflation has only risen above 4% around 10% of the time and measured RPIX inflation 23% of time. Again, this may just reflect a different inflation basket. This fraction of respondents could devote a greater share of their overall spending to goods and services with higher price rises.

Chart 11: Distribution of one-year-ahead inflation expectations, Bank/TNS survey



Sources: Bank of England/TNS.

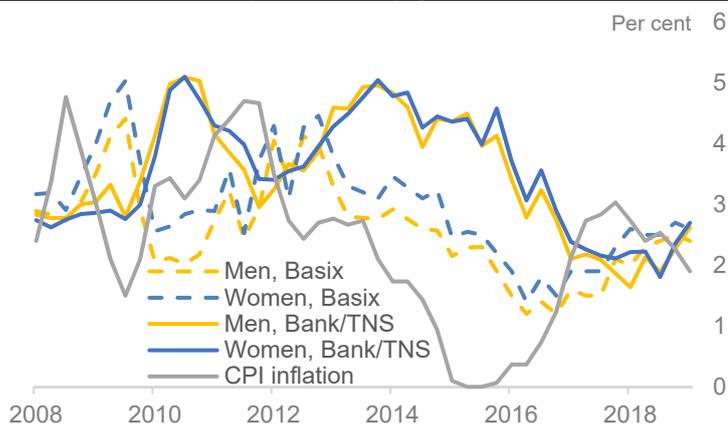
However, the distribution also reveals a growing fraction of households who are unable to form inflation expectations at all. This proportion of households answering 'no idea' is 19% in the latest Bank survey, up from nearer 10% a decade ago. The volatility of the series makes it difficult to be certain of the cause. But there does seem to have been an increase in 'no idea' responses since the EU referendum in 2016, so

¹⁶ I focus on the two surveys for which we have a detailed distributional breakdown, the Bank of England Inflation Attitudes Survey and the Barclays Basix Inflation Survey. Both are conducted quarterly on a sample of UK households and weighted by demographic factors to match the UK. From February 2016 the Inflation Attitudes Survey has been conducted on the Bank of England's behalf by TNS. Previously it was conducted by GfK NOP.

¹⁷ Meeks and Monti (2019).

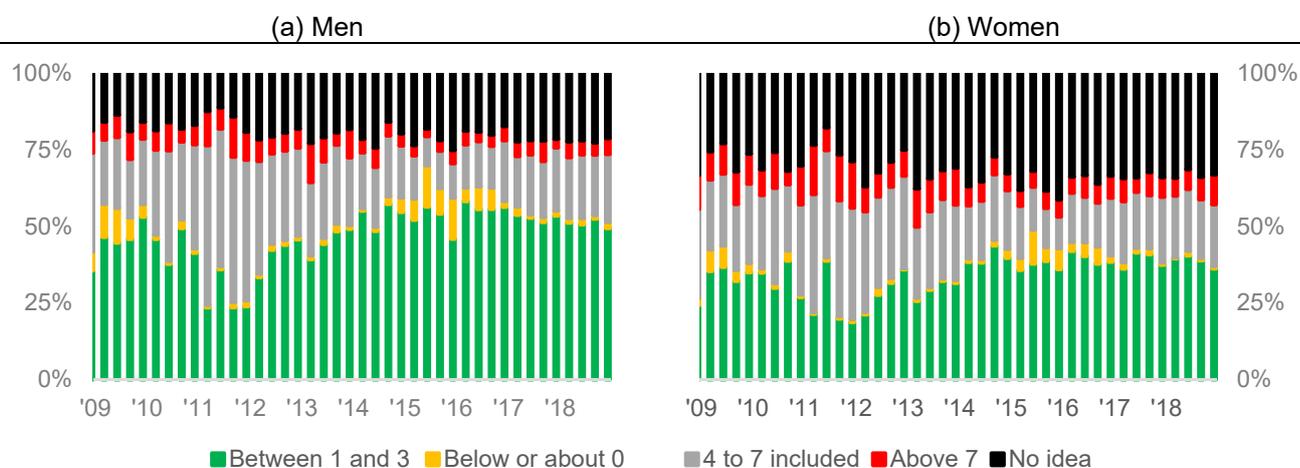
Brexit uncertainty may be playing a role. This increase has been clearer still in questions on long-term inflation expectations, where 44% of households now have no idea what inflation will be in five years' time. Irrespective of why it has increased, the proportion of households giving this response is quite large, suggesting that the gap between households' perceptions and reality may partly be due to differences in financial literacy. Disaggregating the surveys according to demographics provides further evidence for this.

Chart 12: Inflation expectations by gender and CPI inflation



Sources: Bank of England/TNS, Barclays Basix, ONS.

Chart 13: Inflation expectations distribution by gender, Barclays Basix survey



Source: Barclays Basix.

Starting with gender, a common finding in US studies has been that women have significantly higher inflation expectations than men.¹⁸ Interestingly, this does not seem to be the case in the UK (**Chart 12**), where women's inflation expectations are broadly similar to those of men. There appears to be an important gender divide in responses depending on how the question is framed.¹⁹ When asked about 'prices in general' in the Bank survey, the distribution of responses between men and women is broadly similar. However, when

¹⁸ Bryan and Venkatu (2001a, 2001b), Armantier *et al* (2016).

¹⁹ There is a large literature that shows that the framing of survey questions can lead to large differences in responses. See Tversky and Kahneman (1981), for an early example.

asked about the 'inflation rate' in the Barclays Basix survey, women are much more likely to report that they don't know (**Chart 13**). This is consistent with findings in other countries and could relate to differences in financial literacy.²⁰ Alternatively, it may relate to evidence from psychological research suggesting that in areas such as finance, men tend to be more overconfident than women.²¹

Chart 14: One-year-ahead inflation expectations by age group and CPI inflation

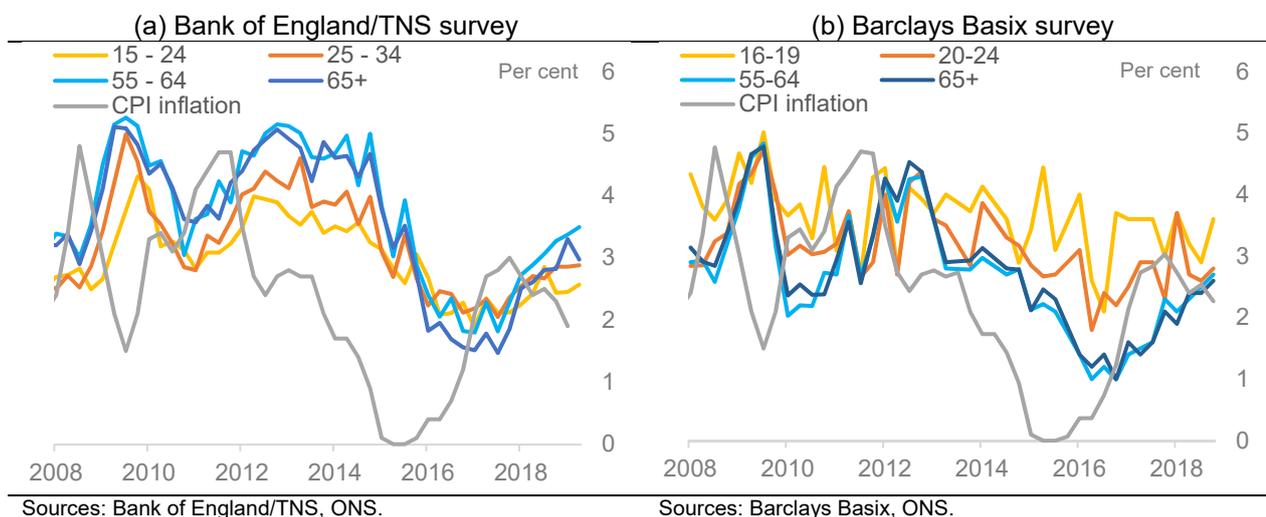
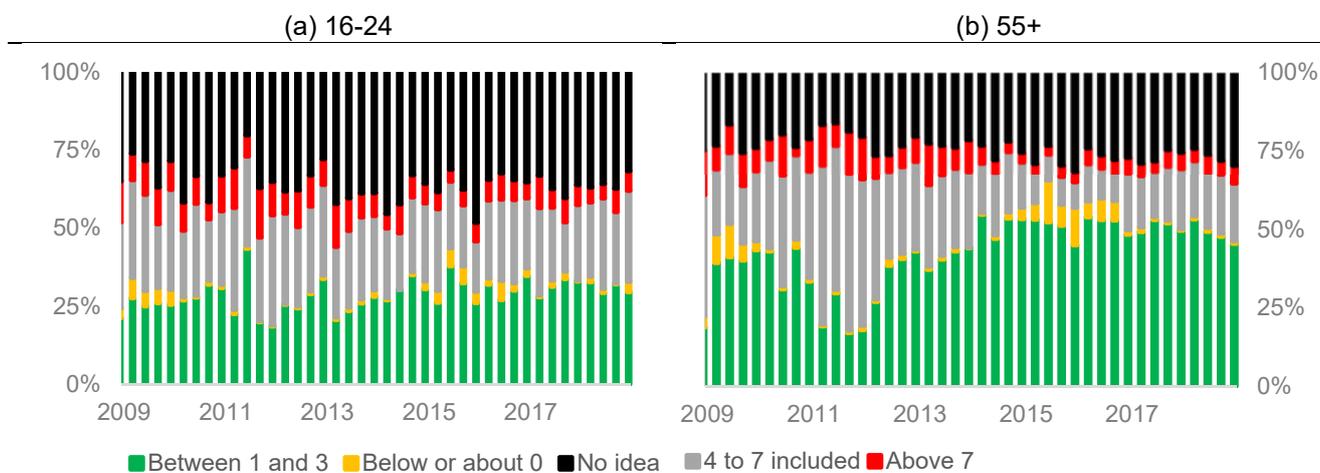


Chart 15: One-year-ahead inflation expectations distribution by age, Barclays Basix survey



Moving on to different age groups, many US studies have found that older generations have higher inflation expectations than younger ones. One theory is that people living through different times have built up different life experiences, which affects their view of the future.²² For example, older generations that can vividly remember the high inflation of the 1970s will report higher expected inflation than younger generations who have only experienced low inflation. In the UK surveys, the picture is mixed. Younger

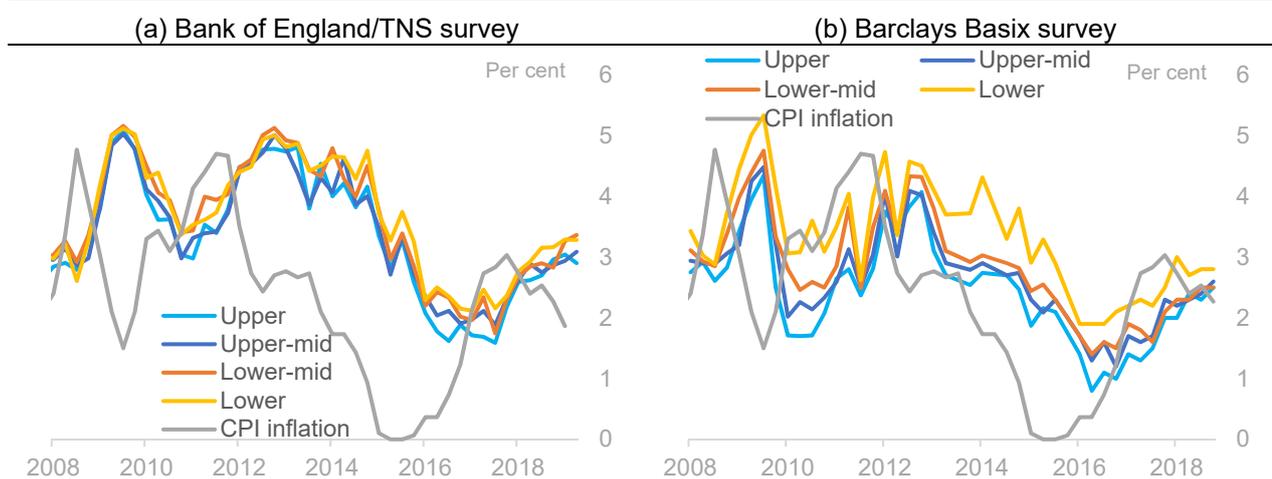
²⁰ Lusardi and Mitchell (2014).

²¹ See Barber and Odean (1999) and also the discussion in Croson and Gneezy (2009).

²² Malmendier and Nagel (2015).

people do report lower expected price rises in the Bank survey, but the opposite is true in the Barclays Basix survey. Asking about the ‘inflation rate’ again exacerbates the gaps among different groups. Older generations’ are better able to form expectations and also appear to predict movements in CPI inflation more successfully (**Charts 14 and 15**).

Chart 16: One-year-ahead inflation expectations by socioeconomic status (NRS) and CPI inflation



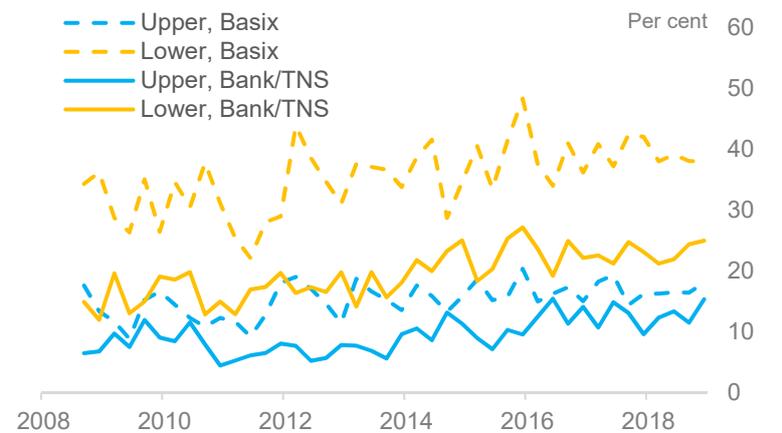
Sources: Bank of England/TNS, ONS.

Sources: Barclays Basix, ONS.

Notes: upper = AB, upper-mid = C1, lower-mid = C2, lower = DE.

Finally, there are differences according to socioeconomic status, as measured by National Readership Survey (NRS) classification, which ranks households according to the chief income earner’s occupation. It therefore captures a mix of income and education. **Chart 16** shows that households in lower classifications tend to have higher inflation expectations, which could be due to different consumption baskets (if they consume more of the goods and services that have higher inflation rates). But households in the lowest classification are also far less likely to be able to provide an expectation for future price changes, with around 35% answering ‘no idea’ in the Barclays Basix survey, compared to 15% of the top group (**Chart 17**). The gap is again larger when asking about the ‘inflation rate’ than ‘prices’, suggesting differences in financial literacy as a factor.

Chart 17: Respondents reporting ‘no idea’ for one-year-ahead inflation expectations, by socioeconomic status (NRS)



Source: Bank of England/TNS, Barclays Basix.

Notes: upper = AB, lower = DE. Bank of England/TNS asks respondents about ‘prices in the shops’ and Barclays Basix asks respondents about the ‘inflation rate’.

A quick detour on long-term inflation expectations

So far I have focused on one-year ahead expectations but I would like to briefly touch upon long-term expectations. In our models, it is long-term inflation expectations that matter more for financial decisions. And since short-term expectations tend to be influenced more by volatility in current inflation, households’ long-term expectations can often give a cleaner signal of their confidence in the MPC’s commitment to bring inflation back to target at an appropriate horizon.

In that context, the increase in median long-term inflation expectations in the latest Bank survey – to a series high of 3.8% – may appear concerning. While something we should watch closely, there is some evidence from the individual survey responses that at least part of the increase represents sampling volatility. Consistent with that hypothesis, it has not been replicated in the other surveys we monitor.

Over a longer time horizon, median long-term inflation expectations have increased since the EU referendum. This could be partly related to the referendum-driven fall in sterling and subsequent increase in CPI inflation. But the distribution of responses suggests a nuanced interpretation. While the median expectation has increased since 2016 Q2, the proportion of overall respondents expecting inflation above 3% has not (**Chart 18**). The reason for the increase seems to be a rise in the proportion answering ‘no idea’ (which has increased from 34% to 44%) and a fall in the proportion answering between 1% and 3%. One possibility is that given the climate of uncertainty since 2016, some households who had previously assumed that inflation would always return to target now feel unable to form any expectation at all.

Chart 18: Long-term inflation expectations distribution, Bank/TNS survey

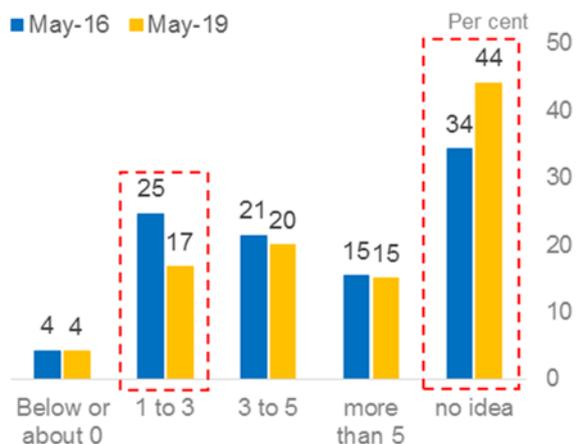
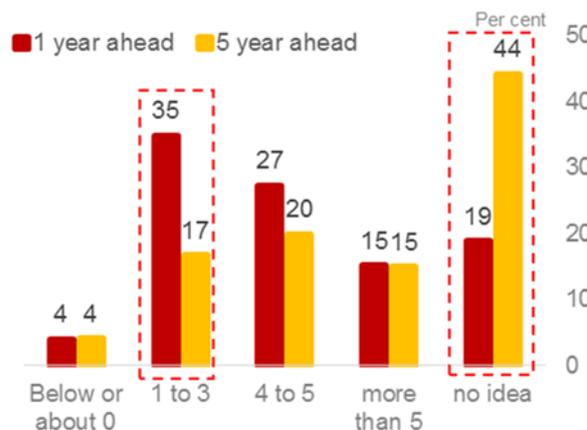


Chart 19: Inflation expectations distribution by horizon, Bank/TNS survey



Source: Bank of England/TNS.

We should also bear in mind that people generally find it difficult to answer questions about things far into the future: in the latest survey, the number of ‘no ideas’ increases from 19% to 44% as we extend the horizon from one to five years ahead (**Chart 19**), with a similar pattern evident in the Barclays Basix survey.

Let me take stock here. When we look beneath the average, we see that there are specific groups of the population that tend to report price change expectations further from the inflation target and from the official data on CPI inflation. There are also differences in the characteristics of respondents unable to form an expectation of future inflation. These respondents are more likely to be women than men; to be young than old; and to be in low income occupations.

Implications and some remarks on the policy outlook

When it comes to setting monetary policy, these results call for caution in interpreting movements in median measures of household inflation expectations. Interpreting the median is tricky when there are changes in the number of households who respond that they do not know. This is especially true for long-term inflation expectations, which are typically most relevant for policy.

For communicating monetary policy and improving public understanding of the inflation targeting framework, the large fraction of households who are unable to form an expectation of future inflation is a concern, particularly if it is due to a lack of financial literacy. It makes the steps we have been making on the MPC to improve our communications all the more important. For example, since 2017, we have published a visual summary of our Inflation Report, which aims to be accessible to a wide audience.²³

More broadly, the Bank of England has been taking steps to improve its educational outreach, as discussed by Haldane (2017), Carney (2018) and recently by Broadbent (2019). Last year my colleagues at the Bank

²³ See Bholat *et al* (2018) for a discussion of the visual summaries of the *Inflation Report*.

launched econoME, an educational programme designed for young people aged from 11 to 16, which aims to improve economic and financial literacy.

The results I have presented today suggest that young people may particularly benefit from improved financial literacy, so improving education for school-age children is crucial. I think that there also remains space to design programmes for slightly older age groups. Here, there is scope for other institutions, like universities, colleges and even employers to help people develop the skills to make more informed choices.

I've talked about a concrete challenge for communications when a significant and growing fraction of households do not have a strong understanding of the inflation process. Today the challenge is made more difficult by the current economic outlook. Uncertainty is the word dominating the mood.

Globally, uncertainty has shown up most clearly in interest rate expectations. Forward rate expectations have fallen in recent months, with market participants now expecting an imminent rate cut in the United States and a continued looser policy stance in the euro area. Risky asset prices had also weakened, although those falls have likely been cushioned by lower risk-free rates.

Increases in trade tensions have been one source of heightened uncertainty, adding further downside risks to a global economy where growth had already slowed over the past 18 months. And a further weakening in sentiment has been evident in output surveys, particularly in manufacturing. The change in sentiment is hard to reconcile with standard trade models, which would predict small direct effects of the tariffs announced so far on large economies such as the US. It is possible that sentiment is responding to broader risks or indirect spillovers not captured in our models.

Some of the moves in risk-free curves are also no doubt related to a weaker global inflation outlook. Despite increases in wage growth, core inflation has remained subdued in the US and in euro area, increasing market expectations of looser monetary policy. Unlike in the UK, there have been large falls in financial market measures of inflation expectations in both regions.

Domestically, Brexit uncertainty continues to play a key role in financial market pricing, as set out recently by Carney (2019). As the perceived likelihood of a no-deal Brexit has risen, pricing has more clearly diverged with the MPC's forecast assumption of a smooth transition to a new trading arrangement. Sterling has depreciated and market-implied Bank Rate expectations now suggest that the next move will be a cut. But those expectations average across a range of very different Brexit scenarios – with markets expecting looser policy (and a weaker pound) in a no deal scenario.

The MPC has explained how in the event of a disorderly exit, the monetary policy response will depend on the balance of the effects on supply, demand and the exchange rate. As I set out in March, in my view it is more likely than not that the appropriate response would be a loosening, but this is by no means certain.

The fall in UK yields is not solely due to perceived changes in the probabilities of different Brexit outcomes. Increased trade tensions and weaker global sentiment are also likely to have spilled over to the UK. Brexit uncertainty has also injected volatility into the outlook for UK activity, with stockpiling responsible for part of the strong growth figure in Q1, which looks likely to give way to a far weaker outturn in Q2.

But the labour market remains tight: employment and hours worked growth have been strong (although average hours seem also to have been boosted by stockpiling in the manufacturing sector). So too has unit labour cost growth, even if wage growth is showing signs of slowing slightly from its 2018 pace. And conditional on a smooth Brexit scenario, a healthy labour market should continue to support household consumption.

Moreover, although measures of core inflation remain subdued relative to labour costs, they have been stable in recent months. Nor are there many signs of weakness in the UK data on inflation expectations. As a result, I still expect that in a smooth Brexit scenario, a small amount of policy tightening will be required over the forecast period to keep demand growing in line with supply.

As for the timing of any tightening; with inflation currently at 2% and likely to fall temporarily below target in the coming months, I did not feel compelled to vote for a policy change at our June meeting. If a Brexit agreement is reached, sterling is likely to appreciate, especially given the prospect of relatively looser monetary policy abroad. A stronger pound would serve to dampen import price growth, moderating upward pressure on CPI inflation from strong labour cost growth. Coupled with signs of a weaker global outlook, recent developments likely lengthen the period until there is a sufficient pickup in inflationary pressures for me to vote to raise Bank Rate. I do not currently anticipate such a pickup in the next few months.

As always, this is my expectation, not a promise. As the data evolve, so too may my view of the appropriate policy setting. If so I will strive to communicate any change in my thinking to economists, to financial markets, and importantly, to the general public.

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