

Re-appointment of Dr Gertjan Vlieghe to the Monetary Policy Committee of the Bank of England

Personal and professional background

1. Do you have any business or financial connections or other commitments which might give rise to a conflict of interest in continuing to carry out your duties as a member of the MPC?

No

2. Do you intend to serve out the full term for which you have been re-appointed?

Yes

3. Have you taken on, or do you intend to take on, any other work commitments in addition to your membership of the MPC. If so, what impact will they have on your work on the MPC?

I am a visiting professor at the London Business School, where I teach two postgraduate courses per year. The time commitment averages to around one day per week, so it fits well with my MPC commitments. The course content is also highly relevant for my MPC work, as it covers the role of financial institutions and central banks in the global economy.

Openness, accountability and performance

4. Is the accountability process delivering better public understanding of decisions made by the MPC? Based on your experience, are there ways in which either the accountability process or the MPC's public communications could be improved?

I believe the accountability process works well. Its key elements are, first, the detailed communication of the MPC's collective and individual views on the economy through the Inflation Report, Minutes, speeches and interviews. Second, this extensive communication allows individual MPC members to be held accountable for their actions by the Treasury Committee. The first aspect, communication, is a process of continuous improvement: recent innovations include the layered approach to the Inflation Report and increased use of social media, both designed to reach a wider audience. The MPC is also steadily expanding the level of detail that it publishes about its own forecast. For example, in the May Inflation Report the MPC's estimate of the degree of excess demand is published for the first time. The MPC also continues to engage directly with a range of businesses, charitable organisation and schools both to communicate about the economy and monetary policy as well as to gather information about the state of the economy.

5. What are the costs and benefits of the MPC collectively, and members individually, providing greater clarity on their expectations for the path of interest rates, including through conditional forecasts?

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It has long been recognised that central banks communicating about monetary policy in general has beneficial effects¹. Monetary policy affects the economy via expectations of future interest rates and future inflation, so being clear about how monetary policy intends to deploy its tools to meet its objectives helps the transmission mechanism of monetary policy work more efficiently.

Communication about the future path of interest rates, which is a narrow aspect of central bank communications in general, has been developing steadily since the MPC's inception. Initially, the MPC forecast was conditioned on a constant path of interest rates. A forecast of inflation above target toward the end of the forecast horizon could be seen as an indication that the MPC thought policy rates were likely to rise, if the economy evolved broadly in line with the forecast. Conversely, a forecast of persistently below-target inflation could be seen as an indication that the policy rate was likely to fall. Such an implicit message was sometimes reinforced with qualitative phrases such as "the Bank continues to see the need for a moderate tightening of policy" (Inflation Report, February 1997).

Subsequently, the Inflation Report also started showing a second set of forecasts, conditioned on the market forward path of rates rather than an assumed constant policy rate. This allowed observers to infer not just the direction of the likely path of policy rates (as judged by the MPC), but also gave some implicit information about the magnitude and timing of future changes: for example, a forecast of inflation above target on constant rates, but below target on market rates, could be seen as an implicit statement that the MPC's own view of the economy required rates to rise over the forecast horizon, but not by as much as the market forward curve.

Some years later still, the MPC switched its focus from the constant rate assumption to the market rate assumption as the primary vehicle for communicating the forecast, while still retaining the – now less emphasised – constant rate forecast in the Inflation Report. This remains the main mode of policy communication today, and it continues to be the case that additional qualitative statements in the Minutes and speeches about the likely future path of policy rates complement these forecasts².

A natural question is whether it would be useful for the MPC to communicate more directly its own view of the likely path of policy rates, rather than communicating it only implicitly via the market-rate and constant-rate forecasts, and qualitatively in the Minutes and speeches. Several other central banks have moved in this direction: the Reserve Bank of New Zealand has been publishing a forecast of growth and inflation based on its own forecast of policy rates since 1997. The Norgesbank and Riksbank followed suit in 2005 and 2007 respectively, and the South African Reserve Bank adopted this framework in 2017. In 2012 the Federal Reserve introduced a different, but related, communication mechanism by publishing the anonymised policy rate forecasts of each board member and regional president, as a set of dots on a chart.

¹ See for example the many references in Blinder et al (2008), "Central Bank Communication and Monetary Policy: A Survey of Theory and Evidence", *Journal of Economic Literature*, Vol. 46(4), and more recently the review by Haldane (2017), "A little more conversation, a little less action", *Bank of England speech*.

² I am abstracting here from the period of explicit forward guidance on interest rates from August-2013 to February 2014, which was a separate communication policy to guide interest rate expectations in the early years of the recovery when there was still substantial slack in the economy.

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There are risks to being too specific about policy-makers' forecasts of future policy rates. First, there is significant uncertainty around policy rate forecasts, just as there is significant uncertainty around the paths for growth, unemployment and inflation. There is a risk that observers of central bank communications underestimate the degree of uncertainty if central banks become too precise in their communication of the projected future path of interest rates. Related there is a risk that a forecast of a future path of policy rates is seen as a commitment, i.e. a promise, rather than merely a forecast. The central bank does not control the economy directly, and most observers understand that very well, so when a central bank makes forecasts for the economy, there is little risk of such forecasts being interpreted as promises. But the central bank does control the policy rate directly, so there is a greater risk that announcing a forecast of future policy rates is seen as a promise. If the economy evolves in a way that is different from the forecast, the central bank should and will set interest rates differently from its earlier forecast in order to bring inflation back to target. Such a deviation from its own interest rate forecast might be misconstrued as reneging on a promise, or it might be argued that the earlier forecast was a mistake. Success in monetary policy is defined by meeting the inflation target even as the economy evolves in unexpected ways, not by the MPC's ability to predict its own actions in advance.

A second possible disadvantage to being too specific about the forecast of future policy rates is that it might be too difficult for a committee to agree on it. Procedurally, it is straightforward to vote on a single month's decision. But agreeing to an entire path for interest rates might be too complex to agree on.³

I think these risks are in fact smaller than the difficulties we already face when communicating with the public. Other central banks that have moved to publishing interest rate forecasts have not found that their forecasts are systematically interpreted as promises. And decision-making by committee has not proved to be an impediment to agreeing on an interest rate forecast⁴. After all, conceptually there is little difference between agreeing on a forecast for the path of inflation (or GDP), and agreeing on a forecast of interest rates: they are all linked together by the structure of the economy and the objectives of monetary policy.

The case in favour of communicating a future path of interest rates lies primarily in clarity and internal consistency. Currently, it is difficult for anyone except seasoned central bank observers to infer from a set of forecasts based on a path of interest rates that the MPC might not intend to follow, what the path is that the MPC does in fact intend to follow⁵. Having to explain an intended path of interest rates by showing a forecast of inflation (e.g. above or below target) that is not expected to prevail even in the central scenario of the forecast, is an unnecessarily complex framework. Publishing more detail about the central path of rates that the MPC believes *would* achieve a return of inflation back to target, as well as showing the growth and inflation path consistent with that policy rate path, would be more easily understood

³ These arguments are discussed in detail in the review by Blinder et al (2008), Op. cit.

⁴ The Riksbank recently published a report that said their own concerns about misunderstood commitments or difficulties in agreeing path did not in fact materialise, and they have generally found that publishing interest rate forecasts improved communications and improved the committee discussions as well.

⁵ See for example Broadbent (2015), "The MPC's forecasts and the yield curve: predictions versus promises", *Bank of England speech*. He pointed out that a wide range of interest rate paths are consistent with quite similar paths of inflation.

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by everyone, not just experienced central bank observers. It would reduce the risk of the MPC's policy intentions being misunderstood. It would also be easier to compare forecasts over time: if the economy had, say, surprised to the upside since the previous forecast, the MPC would collectively communicate how much of a difference that had made to their projected path for interest rates, as well as GDP and inflation.

On balance, I favour moving in the direction of being more explicit about the policy path that is expected to return inflation sustainably to target. The advantages outweigh the risks, in my judgement. I think such a change would represent a further, modest, evolutionary improvement in communications.

6. What are the main operational challenges now facing the MPC? How has the picture changed since 2015?

The MPC has both Bank Rate and the Asset Purchase Facility available as tools for easing or tightening monetary policy, supplemented by the Term Funding Scheme. Bank Rate is considered the primary tool: it is better understood and has been used for far longer, domestically and in other countries. The other tools were only deployed once Bank Rate was near its effective lower bound and further stimulus was needed.

Although there is an asymmetry in that there is more scope to tighten policy with Bank Rate than to ease policy with Bank Rate due to the presence of an effective lower bound on interest rates, Bank Rate is not currently at its lower bound (as clarified most recently in the August 2016 Inflation Report). And while there are practical operational limits on the quantity of gilts that can be held in the APF, we are currently well away from those limits. Moreover, the MPC can decide to buy assets other than gilts, as it did in August 2016.

The MPC is therefore not operationally constrained in the use of its policy tools to meet the 2% inflation target. Since late 2015, I judge that we have moved further away from the constraints: (a) the TFS allows Bank Rate to be cut to a lower level while still allowing banks to pass on the rate cuts; (b) the evolution of the economy has been such that less stimulus is now required than in 2015, as global growth and inflationary risks have become more symmetric rather than being skewed to the downside, and domestic slack has been further reduced.

Monetary and economic policy

7. What are the most significant risks to growth and inflation? Do you see any trends that give cause for either particular optimism or alarm?

UK growth has slowed steadily since 2014 from more than 3% to 1.2% in the most recent four quarters, but the unemployment rate has continued to fall, suggesting growth has nevertheless been stronger than potential growth, so that economic slack has continued to be eroded. I will discuss the major risks to the UK economy as they relate to (a) the future pace of demand growth (b) the future pace of supply growth (c) the extent to which reduced slack in the economy is leading to upward pressure on medium-term inflation.

- (a) Future demand growth: the pace of growth in the world economy has generally strengthened from mid-2016 to late 2017, which has provided a tailwind for UK

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demand growth via improved net trade and investment. The pace of global growth has slowed in Q1 2018. Some of that was likely due to erratic factors such as weather (Eurozone, UK) and timing of tax payments (US). If global growth weakens more persistently, that would present a downside risk to UK growth. Sources of downside risk are a tightening of global financial conditions, an escalation of trade conflicts, a sharper than expected slowing in China. However, still loose financial conditions combined with a less fiscal drag (on average, across advanced economies) presents an upside risk to the MPC's forecast of a gradual slowing in global growth, such that the overall risks to that global outlook are broadly balanced

UK GDP growth slowed sharply to 0.1% in Q1. That was a bigger deterioration than most of the business and consumer surveys suggested, and the weather acted as a drag on construction and retail activity. Demand growth is likely to pick up again in Q2. The domestic risks to the demand outlook in the coming quarters are primarily Brexit-related. The Brexit-related fall in the exchange rate pushed up inflation to a peak of 3.1% in late 2017. With the peak impact of the exchange rate on inflation probably behind us, my expectation is that inflation generally declines this year. Last year's rise in inflation eroded household real income growth, and led to a significant slowing in consumption growth from more than 3% to just over 1%. As inflation falls back, and wage growth improves somewhat due to reduced labour market slack, household real income growth is set to pick up this year. That should support consumption growth. Last year, however, households reduced spending by less than the reduction in real income they faced, i.e. the savings rate fell. A key risk for this year is to what extent household will spend the additional real income, or use it to rebuild the savings that were eroded last year.

Turning to business investment growth, the UK has fallen behind the rest of the G7 in 2017. Uncertainty surrounding Brexit is likely to have been an important driver of that divergence. Looking ahead, there are upside risks to investment growth if a transition agreement is successfully negotiated, and businesses take a favourable view of the impact of the UK's future trading relationships on the economy, which could unlock some pent-up investment demand that has been postponed while awaiting further clarity. There are downside risks to business investment if Brexit negotiations evolve in such a way that a desirable eventual outcome is judged less likely.

- (b) Supply growth: UK productivity growth has been unusually weak over the past decade. Productivity growth has fallen across advanced economies, and has fallen a little more in the UK. No precise estimates are possible, but around half of the slowdown appears to be due to firms operating with too little capital, relative to the labour they employ (see e.g. February 2018 Inflation Report). This could reflect either or both the persistently weak business investment or the strong employment recovery. Deleveraging in the financial sector has also contributed to weakness in measured productivity directly⁶. Improved business investment growth, and the end of financial sector deleveraging, should lay the foundation for some improvement in productivity growth in the coming years, and that is what

⁶ Tenreyro (2018), "The fall in productivity growth: causes and implications", Bank of England speech. This questionnaire, and a full CV, should be returned to the Treasury Committee by noon Thursday 10 May 2018 (in Word and PDF format)

the MPC expects. These forecasts are conditional on households, firms and financial markets assuming a smooth transition to the UK's new trading relationships. Productivity growth is forecast to improve from below 1% to a little above 1% in the coming years, but productivity growth remains notoriously difficult to forecast. In the near term, the risks are probably skewed in the direction of seeing a smaller improvement than in our central forecast.

Total potential growth consists of productivity growth as well as labour force growth. The prospects for labour force growth depend on trends in participation, demographics and immigration. Participation rates in the UK have generally risen over the past years, as rising participation rates of older workers has outweighed the changing demographic mix towards older workers, who have lower participation than younger workers. Inward migration flows have declined since the referendum, which has acted to lower labour force growth somewhat. The MPC judges that, taking together trends in productivity, participation and the ONS assumption on the path of immigration, total potential supply growth in the UK is likely to be around 1 ½ % in the coming years.

- (c) Slack: the UK unemployment rate has fallen to 4.2%, a 43-year low. Measures of under-employment are not at record lows, but have nevertheless also fallen back in recent years. Surveys of skill shortages and recruitment difficulties are generally at high levels. Taken together, the evidence suggests that the amount of slack in the UK labour market has been significantly reduced in recent years. Over the past year or so, tentative evidence has emerged that this is starting to push up wage growth. Private sector regular pay growth has increased from 2.0% y/y to 2.9% y/y over the past year, which is encouraging, although we have reached this pace of wage growth twice before in the past few years when it did not turn out to be a signal of a sustained pick-up. There is some additional evidence that the current episode will be more sustained, for example from the Bank's Agents' survey on pay settlements, which signals a more material pick-up than we have seen thus far. I have documented recently⁷ that the relationship between labour market tightness and wage growth in the UK has changed, but has not disappeared. A lower unemployment rate should still be expected to push up on wages. But other factors have lowered wage growth for a given unemployment rate: lower structural unemployment, public sector wage restraint, downward nominal wage rigidity, weak inflation expectations and weak productivity growth. Several of these wage headwinds are fading now. And weaker productivity growth means that wage inflation that is consistent with the MPC's inflation target is lower than it was before the recession.

8. Based on the current MPC forecast, how do you expect interest rates to change over (a) the next year, and (b) the next three years? How do these expectations compare with those of other MPC members?

As I have outlined in my most recent speech⁸, my current forecast for growth and inflation is consistent with a gradually rising path of interest rates. My own central

⁷ Vlieghe (2018), "From asymmetry to symmetry: changing risks to the economic outlook", Bank of England speech.

⁸ Vlieghe (2018), op.cit.

projection will require one or two quarter point rate increases per year over the three-year forecast period. That path would bring us closer to the neutral policy rate, which I continue to think is likely to be well below the neutral rate that prevailed before the recession. My interest rate forecast is subject to significant uncertainty, both because there is uncertainty about how the economy will evolve for a given neutral rate, and there is uncertainty about the path of the neutral rate itself.

I can only compare my projected path for interest rates to the path the MPC forecast is conditioned on. I cannot comment on other MPC members' individual judgements on the appropriate path of interest rates. My central forecast for policy rates is slightly above the conditioning path of rates derived from market yields in the May Inflation Report forecast, which assumes just under three quarter point rate increases over the three-year forecast period.

9. What are the principal risks associated with monetary policy normalisation, and what can be done to mitigate them?

One risk associated with raising interest rates after a long period of very low interest rates is if the change is unexpected, that borrowers have become complacent about the risk of rising rates. That could lead to a sharper reduction in demand growth than was intended. While the MPC will continue to be vigilant in this respect, the experience so far after the November 2017 rate hike does not suggest this risk has materialised.

First, the rise in interest rates was not a surprise. Surveys suggest it was anticipated by households and businesses, helped by MPC communications about the need for some withdrawal of monetary stimulus in the quarters leading up to the November decision.

Second, while there are always some borrowers who are highly vulnerable to a rate rise, the vulnerability has decreased since 2008, not increased. Aggregate debt to income ratios for UK households have fallen from a peak of 140% to around 125%. The proportion of households who spend more than 40% of their income on servicing mortgage debt has fallen from a peak of 2 ¾% to 1 ½%, similar to the levels seen in the early 2000s.

To mitigate the risks associated with interest rates increases after a long period of low interest rates, it is important that households and businesses carry out their financial planning in such a way that it is robust against increases in interest rates. Clear communication from the MPC on the risks around the future path of interest rates is therefore important. FPC actions, such as the introduction of affordability tests that factor in a 300bp rise in Bank Rate, also help mitigate risks.

A second risk associated with monetary policy normalisation is the unwinding of asset purchases, which is likely to take place at a later stage when policy rates have moved up sufficiently that they can be used effectively in either direction. The lack of historical experience in using the asset purchase tool means its impact is more uncertain. A key risk mitigation strategy is to proceed cautiously, at least initially, and to communicate clearly in advance how the MPC is planning to execute the balance sheet reduction. US experience to date suggests that these strategies have been successful for them.

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10. To what extent are you concerned that a reduction in global trade will negatively affect the UK economy?

So far, the US has introduced steel and aluminium tariffs, from which the EU and some other countries are currently exempt. The US has subsequently proposed tariffs on USD 50bn of imports from China, and China has proposed retaliatory measures on imports from the US, to which the US is considering countermeasures. The tariffs that have been implemented so far have been too small to have a material effect on the UK economy. Even if the additional measures discussed so far are implemented as well, it would probably still not have a material effect on the UK. The risk scenario is one where there is significant broadening of the scope of tariffs across a wider range of goods, and/or a broadening of the set of countries that implement the tariffs, for example to include the EU. That could lead to a slowdown in global trade that can hurt the UK economy by several tenths of a per cent of GDP or more. It is impossible to put a cap on the estimate, since it simply depends on how high and how widespread the tariffs become, and the extent to which the escalation damages confidence and financial market conditions. Since a tariff war would be mutually destructive (nobody gains, everyone loses), my expectation is that the full threat would not be carried out. The risk is not zero, but very difficult to quantify. The implication for monetary policy, should the risk materialise, is not straightforward. A global trade war would simultaneously reduce GDP and increase inflation via higher tariffs. The direct inflation impact is likely to be temporary, but the balance of demand on supply is uncertain. The shock to confidence and the real income erosion would damage investment and consumption demand, while the disruptive effects on supply chains might damage supply. A monetary policy easing would only be appropriate if the inflation effect is expected to be short-lived, and if the demand effect is larger than the supply effect. That is not guaranteed to be the case.

11. What is the outlook for consumer spending in the UK?

Consumption growth slowed materially since 2016, from just over 3% to just over 1%. That slowing was likely driven by the reduction in real income growth, as the exchange-rate-driven bout of inflation in 2017 eroded households' purchasing power.

However, consumption slowed by less than households' real income growth. In other words, the savings rate declined. A declining savings rate is typically a sign of confidence, in the sense that households, on average, act in a way that is consistent with a belief that the reduction in real income levels was temporary. However, the MPC's forecast is that the levels effect is not temporary. Real income growth is set to improve this year as wage growth picks up slightly and inflation eases back, but real income is not expected to grow rapidly enough to make up for the previous weakness. Unless the exchange rate rises back to pre-referendum levels, imports have become permanently more expensive. In such an environment, household might want to raise their savings rate somewhat, which would depress spending growth. Working in the other direction, the low and falling rate of unemployment tends to act to lower the savings rate. On balance, the MPC central forecast is for consumption growth to remain close to 1%, with risks in either direction. That is also my forecast.

12. How effective is the co-ordination of monetary and macroprudential policymaking between the MPC and the FPC?

I take co-ordination in this case to mean that each committee should be aware of how the other committee's actions affect their objectives and the effectiveness of their tools. Joint MPC and FPC briefings and regular staff analysis ensure that the MPC is well briefed on the FPC's concerns and policy actions, and vice versa.

The MPC is generally concerned with average outcomes, while FPC policy aims to limit tail risk. In general, the influence of each committee's action on the other's objectives is small. One can imagine circumstances where actions of one committee have stronger spill-overs to the objectives of the other committee. But these circumstances have not arisen during my time on the MPC.

For example, the MPC remit specifies that circumstances might arise where interest rates need to be set to meet a financial stability objective, if available macro-prudential tools are not sufficient⁹. Conversely, one might imagine a case where the degree of macro-prudential tightening is so severe that it interferes with the MPC's ability to meet the inflation target. Neither has happened yet, and I would expect these circumstances to occur only rarely.

Recent policy actions by the FPC have focused on rebuilding the counter-cyclical capital buffer and focusing on risks to the financial sector from consumer credit. In terms of their impact on the central path for growth and inflation, these actions have generally worked in the same direction as the intended effect of monetary policy, namely a very modest tightening. But the impact of FPC actions on the MPC's central projection has been small enough that it has not required a significant recalibration of monetary policy.

13. What is your current estimate of the size of the output gap, the potential rate of productivity growth, the natural unemployment rate, and the equilibrium rate of interest?

The unemployment rate is at 4.2%, lower than the level that prevailed immediately before the recession, and close to the MPC's central estimate of the natural rate of unemployment of 4 ¼%. The MPC has already revised its estimate of the natural rate of unemployment lower, and I broadly agree with those updated estimates.

Measures of underemployment are not quite back to their pre-recession levels¹⁰. Underemployment measures include, for example, the number of workers who work part time but would like to work full time, or the number of additional hours that workers say they would like to work.

Combining unemployment and underemployment, it is likely that there is only a small amount of slack left in the UK economy. Estimates are highly uncertain, but my current estimate is between zero and half a per cent.

Productivity growth in the UK has averaged ½% to ¾% over the past several years, which is unusually weak. Some improvement in business investment, and more so

⁹ This possibility was the motivation for the "financial stability knock-out clause" in the MPC's policy rate guidance from August 2013.

¹⁰ Vlieghe (2018), *op.cit.*

outside the UK, as well as the end of UK financial sector deleveraging, should lead to an improvement. I agree with the MPC's central estimate of an improvement to around 1% over the forecast period. When productivity growth is at a multi-century low¹¹, over a long enough horizon it is reasonable to expect an improvement. The risks over the next few years, however, are probably skewed to the downside of our 1% forecast.

There are many ways to define the equilibrium rate of interest. I will use the definition that it is the rate of interest that is consistent with no output gap and inflation at target. There are many factors that move the equilibrium rate over time. Some are structural, meaning slow-moving and expected to prevail over many years. Some are cyclical. I have discussed these in some detail in previous speeches¹². Over the past couple of years or so, some drivers of the equilibrium interest rates have changed. Structurally, the period of private sector deleveraging in the UK has come to an end, which has probably pushed equilibrium rates up a little. Other drivers, such as population ageing, are likely to be with us for many more years, and might even intensify, acting to reduce the equilibrium interest rate. Both the end of deleveraging, and demographics trends, are particularly powerful because they are taking place not just in the UK but in a large part of the global economy. Cyclical drivers have also changed: fiscal policy is less contractionary, in the UK and globally¹³. But headwinds from Brexit uncertainty are a new and UK-specific phenomenon acting in the other direction in recent years. It is impossible to be precise about all these different drivers. I have previously said that I thought the equilibrium nominal rate for the UK was between 1 and 3 per cent. In 2015, I thought we were probably at the low end of that range. Now I think the risks are more symmetric within that range.

14. What are the material differences between your personal forecast for the UK economy, and the MPC's collective view?

At the moment, there are no material differences between my forecast for the economy and the MPC's collective view as published in the May Inflation Report. I agree that growth is likely continue to at a modest 1 ½ to 1 ¾ pace, which is probably sufficient to continue to erode slack, so that the economy will move into excess demand over the forecast period and domestic inflationary pressure are likely to rise even as the fading contribution from past import price rises leads to a fall in headline inflation this year. Provided the headwinds from Brexit uncertainty do not intensify in the near term, and ultimately fade over the coming years, I think policy rates are likely to rise, in my central view, by 25bp to 50bp per year over the forecast period. That is slightly higher than the conditioning assumption for interest rates in the May 2018 Inflation Report. That is a forecast, not a promise, and will depend on how the economy evolves. I think it is useful to summarise the UK outlook as being currently primarily determined by the balance between tailwinds from the global economy (including easy global financial conditions) and headwinds from Brexit uncertainty. If that balance changes, so will the appropriate path of interest rates.

¹¹ See e.g. chart 3 in Tenreyro (2018), op.cit.

¹² Vlieghe (2016), "Debt, Demographics and the Distribution of Income: New Challenges for Monetary Policy", Bank of England speech. Vlieghe (2017), "Real Interest Rates and Risk", Bank of England speech.

¹³ Vlieghe (2018), op.cit.

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