The path to 2 per cent – speech by Silvana Tenreyro

Given at Society of Professional Economists Annual Conference London

Published on 11 November 2022

In this speech Professor Silvana Tenreyro explains how energy prices affect inflation, and how that can depend on the strength of the labour market. She discusses how government and financial-market responses to the economic shock may inform the Monetary Policy Committee's decision on interest rates.

She sets out how these factors interact, and explains why in her assessment it was necessary to raise interest rates by 0.25 percentage points at the November 2022 Monetary Policy Committee Meeting.

Speech

These are extremely challenging times for the global economy, and the UK economy in particular. We have been going through a period of extraordinary volatility in financial markets, and in the outlook for the UK economy. And this has come on the back of a period of successive, enormous shocks, starting with the Covid pandemic, and now dominated by energy prices.

In the face of such extraordinary events, one might expect an extraordinary response. But today I want to argue that while monetary policy will need to take into account all of the effects of these large economic shocks, and the responses to them of fiscal policy and financial markets, we should do so in a thoroughly ordinary way. As always, we should be guided by our remit. We need to bring inflation back to the 2% target sustainably.

This resolute focus on the inflation target is the key thing I would like to stress today. The goal of monetary policy is not to offset in their entirety movements in energy prices, nor changes in the exchange rate, gilt yields or mortgage rates. While all affect the economy, we do not target any of them directly. Sometimes their movements will reflect market volatility, and sometimes they will reflect more persistent, real adjustments. It is not within the power of monetary policy to prevent those adjustments from taking place.

We need instead to calibrate our response through the lens of our remit. What is the impact on demand? On supply? And on inflation? And that will tell us where interest rates need to go. Different MPC members will make different assessments of those impacts. They may therefore also come to different policy decisions. This was the case in November, when I voted for a smaller increase in Bank Rate than the rest of the committee. But we are all agreed on where we are heading: on the path back sustainably to our 2% inflation target.

I will emphasise three points:

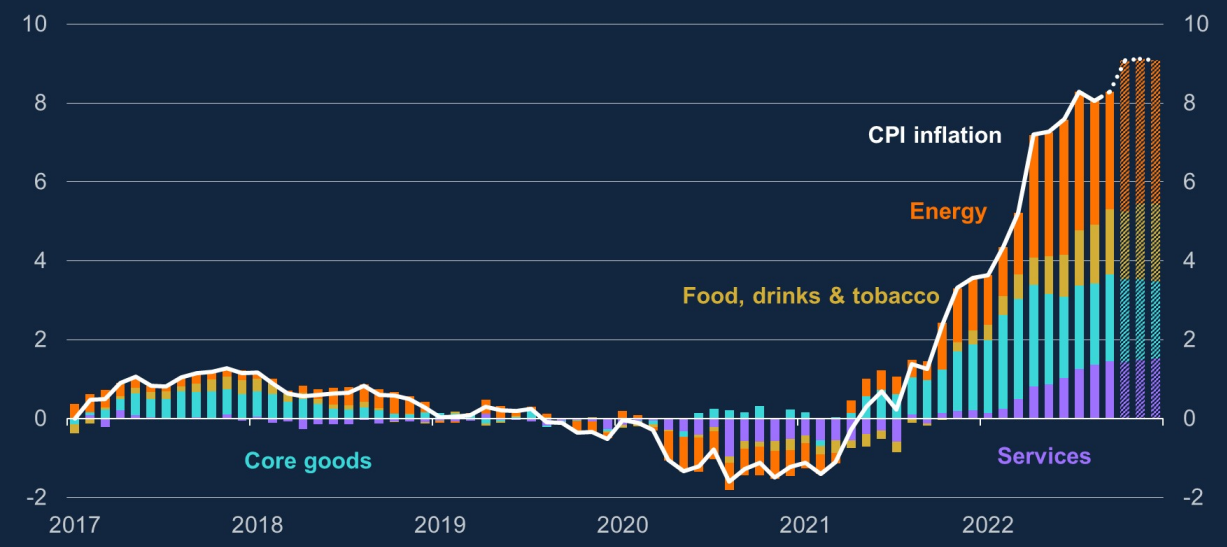
- Energy price increases push up inflation in the near term. But in the medium term, they have disinflationary effects through lower real incomes, lower demand and higher unemployment. These need to be balanced against any second-round effects that could slow the fall in inflation.
- Following shocks, monetary policy will return inflation to the 2% target. When shocks cause movements in asset prices such as gilt yields or the exchange rate, policy need only offset the effect on inflation, not prevent those movements entirely.
- Monetary policy has tightened significantly this year, but most of its effects on demand have yet to occur. Too high a path for Bank Rate therefore risks oversteering inflation below target in the medium term.

The shock: energy prices

The main driver of high inflation this year has been an extraordinary increase in global energy prices. As **Chart 1** shows, a large part of the above-target inflation in the UK right now is accounted for by the direct mechanical effect of high energy prices on consumer prices. And a further share comes from indirect effects, since energy is an important input in the production of many goods and services.[1]

Chart 1: Energy prices have been the main driver of above-target inflation

Contributions to difference in CPI inflation versus 2012-19 average (a)

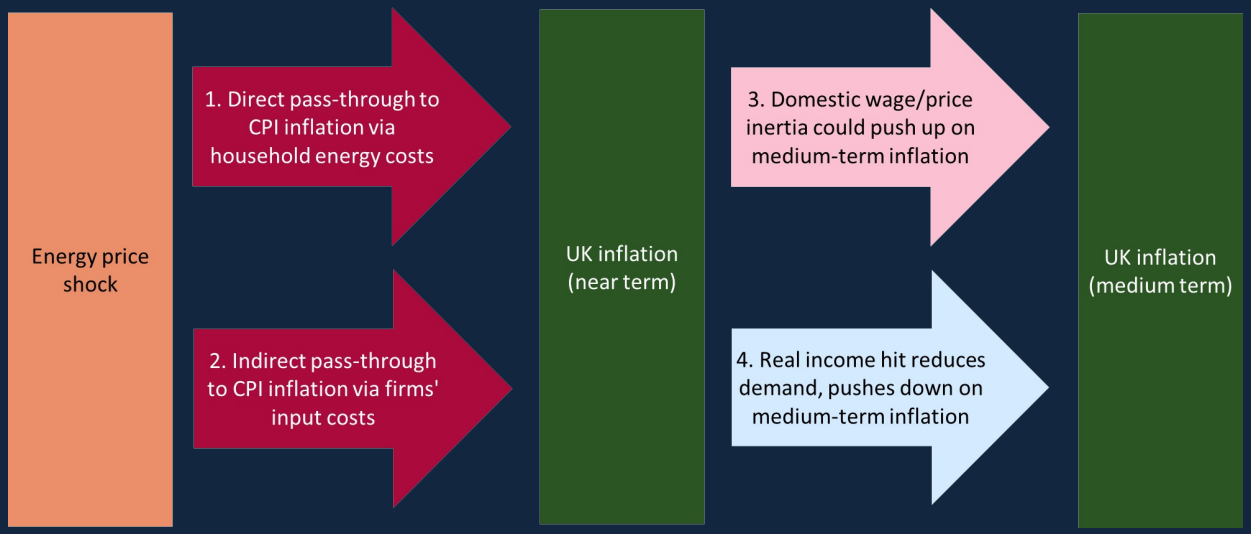


Sources: Bloomberg Finance L.P., Department for Business, Energy and Industrial Strategy, ONS and Bank calculations.

(a) Data to September 2022. Bank staff projection from October 2022 to December 2022. Fuels and lubricants estimates use Department for Business, Energy and Industrial Strategy petrol price data for October 2022 and then are based on the sterling oil futures curve.

The appropriate monetary policy response to energy shocks is not automatic. Increases in energy prices have several different effects, which can push inflation in different directions. **Figure 1** illustrates these channels. Their effects operate at different horizons, which is important, since the main impacts of monetary policy come after a lag, so we need to be able to account for the relative strength of these channels in the future. And that relative strength will depend on the size and nature of the energy price shock, as well as on broader economic circumstances. Those include the backdrop in the labour market, the response of fiscal policy, and any responses in financial markets. Each quarter the MPC uses its forecasts to assess the balance of these different effects, so it can set monetary policy to bring inflation sustainably to 2% in the medium term.

Figure 1: Stylised transmission of an energy price shock to UK inflation



The first, **direct effect**, of energy-price increases is straightforward. Energy prices are determined on globally traded markets. These wholesale energy prices are passed on directly to petrol prices paid by consumers, as well as to the prices charged on household gas and electricity bills.[2] When these rise, they directly push up on UK consumer price inflation. Energy only makes up 7% of the CPI basket.[3] But because energy prices have been increasing around 60% over a 12 month period, they directly contribute about 4 percentage points to the sharp increase in UK inflation (**Chart 1**).[4]

The second channel is **indirect supply-chain effects** through firms' input costs. The production of many goods, but also of some services (e.g. transport services or restaurants) require a substantial amount of energy. And even for firms where energy makes up only a small share of their total costs, such a huge increase in energy prices can still lead to a material cost increase. Firms also use intermediate inputs in production, the prices of which may also have increased owing to rising energy prices. In 2019, energy accounted for 2.3% of the input costs for the firms that produce non-energy goods and services in the CPI basket.

These indirect effects from firms' input prices are always an important part of the transmission of energy-price movements. But pass-through this time may have been amplified by the sheer size of the shock, which is likely to have limited firms' ability to absorb such large cost increases via lower profit margins. Bank staff estimates suggest that around ¾ of a percentage point of current CPI inflation from other categories of goods and services comes from the indirect effects of higher energy prices.

What do these direct and indirect effects imply for monetary policy? The key observation is that the main effects of monetary policy come through with some delay. Estimates of the speed of

policy transmission vary, but typically suggest that the largest impact of policy on inflation comes somewhere beyond the first year.[5] That makes responding to these short-lived price-level impacts counterproductive, since they drop out of the annual inflation calculation by the time the policy impact is at its peak. Trying to offset them would be liable to cause more inflation volatility rather than less, making it more difficult to meet the inflation target in the medium term.[6]

Instead, my policy decisions have focused on the final two channels in **Figure 1** – inertia, or second-round effects, and lower real incomes. These capture the potential effects of the energy price shock on medium-term inflation. They push the appropriate policy response in opposite directions, so assessing both the size and even the direction of the appropriate policy response depends on quantifying each channel.

So-called "second-round effects" refer to a variety of mechanisms that lead to **inertia from domestic wage and price setting**, which, if persistent enough, could push up on inflation into the medium term. These are typically a product of various rigidities in real wages, profit margins and relative wages and prices. Similar channels could arise from increases in short-term inflation expectations, although survey measures of these are closely correlated with actual inflation. This makes it difficult to identify any independent influence of forward-looking short-term expectations, over and above backward-looking inertia.[7]

To explain where this inertia comes from, note that the energy-price shock has worsened the UK's terms of trade, making the country poorer. To the extent higher energy prices persist, the loss in national real income must ultimately be absorbed via some combination of lower real wages and lower profits for the economy overall. If every worker and firm's real wages and profits fully adjusted to the energy price shock instantly, then there would be no further inflationary impact after the direct and indirect effects dropped out.

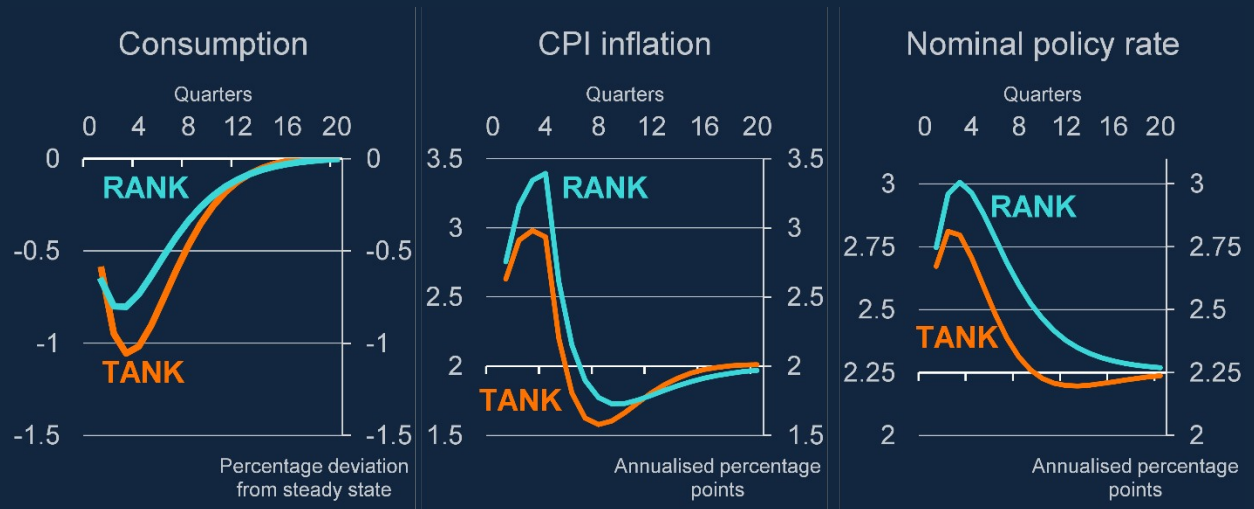
The second round effects arise because in reality, some firms or workers will receive higher nominal revenues or incomes, rather than adjusting downwards. For example, some price contracts are indexed to CPI or RPI inflation; some firms have offered higher than usual pay increases, or additional pay rounds, to help with higher energy costs; and more generally measured inflation is often used as a reference point in salary negotiations. If these increases are not offset by even larger real wage or price declines elsewhere, then in aggregate we see real wage or real profit resistance, which will slow the speed with which wages and domestically driven prices fall back to target-consistent levels.[8]

Second-round impacts on domestic wage and price setting need to be balanced against the disinflationary **effect of lower real incomes**, the final channel in **Figure 1**. In the UK, the evidence suggests that large or persistent increases in energy prices should lead to large falls in demand relative to supply, resulting in higher unemployment and downward pressure on real wages, ultimately weighing on inflation in the medium-term.[9] For a net energy importer like the UK, the fall in real incomes is simply a reflection of the deterioration in our terms of trade.

Demand is likely to fall even if energy prices fall back, albeit by less than if they stay high persistently. This is what happens in the MPC's November MPR forecast, which is conditioned on the fall in energy prices implied by futures markets. If increases in energy prices are temporary, or people expect them to be so, they may seek to smooth their consumption by borrowing more, or reducing savings. In basic representative agent models, there is little effect on consumption of temporary falls in real income for this reason. But in reality, a significant share of households are credit constrained, or consume partly or fully out of current income. This means that a temporary fall in real incomes can still lead to a material fall in consumption. A recent paper by Bank colleagues (**Chan, Diz and Kanngiesser, 2022**) shows how in a (TANK) model with heterogeneous agents, such a channel leads to a larger drop in consumption and a less inflationary shock (**Chart 2**).[10]

Chart 2: Model responses to an energy-price shock

Impulse response functions from Chan, Diz and Kanngiesser (2022) (**a**)



Source: Chan, Diz and Kanngiesser (2022).

(a) Cyan lines show responses in a Representative Agent New Keynesian (RANK) model where the representative household faces no borrowing constraints. Orange lines show responses in a Two-Agent New Keynesian (TANK) model where one type of household is credit-constrained. The nominal policy rate in the model is set using a Taylor rule.

The appropriate policy response to the energy shock has hinged on the balance of these two offsetting effects on medium-term inflation. The channel from lower real incomes to demand is larger in net energy importers like the UK than in the US.[11] It also depends on households' ability or willingness to maintain consumption and therefore demand by cutting back on energy and energy-intensive goods and services – their elasticity of substitution. If this is small, then the impact on demand is likely to be larger.

The strength of inertia in domestic wage and price setting will depend to a large degree on the energy shock itself. The larger and more persistent the increase in energy prices, the bigger are likely to be the second-round effects. Over the decades, structural changes to the UK economy have reduced the typical scale of second-round effects, for a given increase in inflation. But as the energy-price shock has built over the past year, so too has the likely scale of any inertia. Partly as a result, I have judged that some policy tightening has been required.

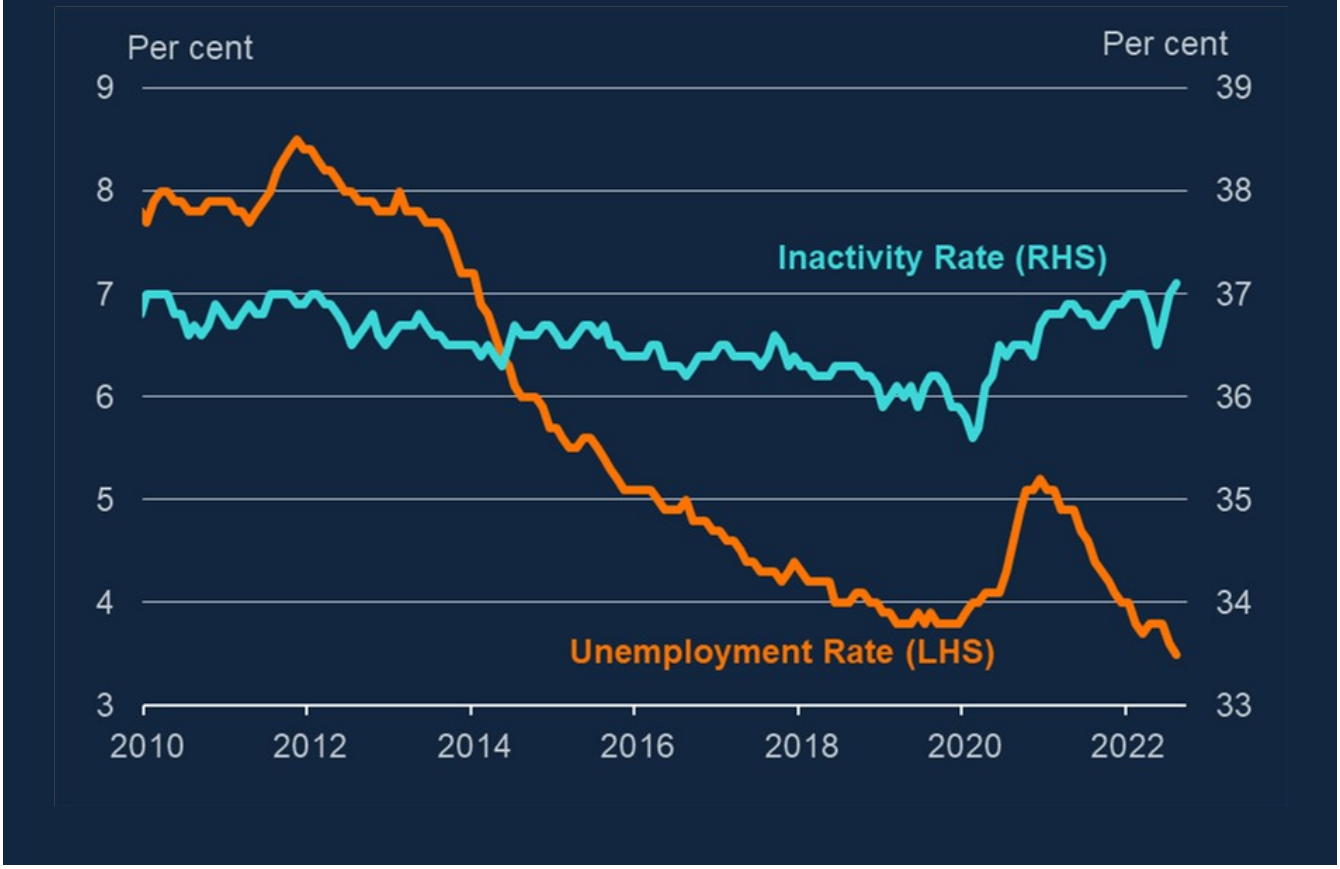
Higher interest rates cannot necessarily prevent second-round effects from occurring. Some, for example from types of indexation, are a mechanical consequence of the large direct and indirect effects of higher energy prices.[12] However tighter monetary policy can lean against their impact on inflation. By weakening demand and increasing the amount of slack, policy can help push down on domestic wage and price pressures where those wages and prices are not indexed, counterbalancing the inertia that resulted from the energy price shock.

It is also possible that some second-round effects interact with the state of the labour market.[13] For example, perhaps some workers in a tight labour market can push for wage rises in line with inflation when it is easier to find an alternative job.[14] If so, the ultimate impact of any energy-price increase also depends on conditions in the labour market.

The backdrop: the labour market

A key backdrop for our response to the energy price shock is that the UK labour market tightened considerably as the economy emerged from the pandemic, and remains tight in absolute terms. The unemployment rate fell to 3.5% in the three months to August, its lowest level since 1974 (**Chart 3**). The number of unemployed people has fallen below its pre-Covid level, and there continue to be more vacancies than there are unemployed.

Chart 3: Unemployment has fallen and inactivity has increased Unemployment rate and inactivity rate for those aged 16 and over



Sources: ONS.

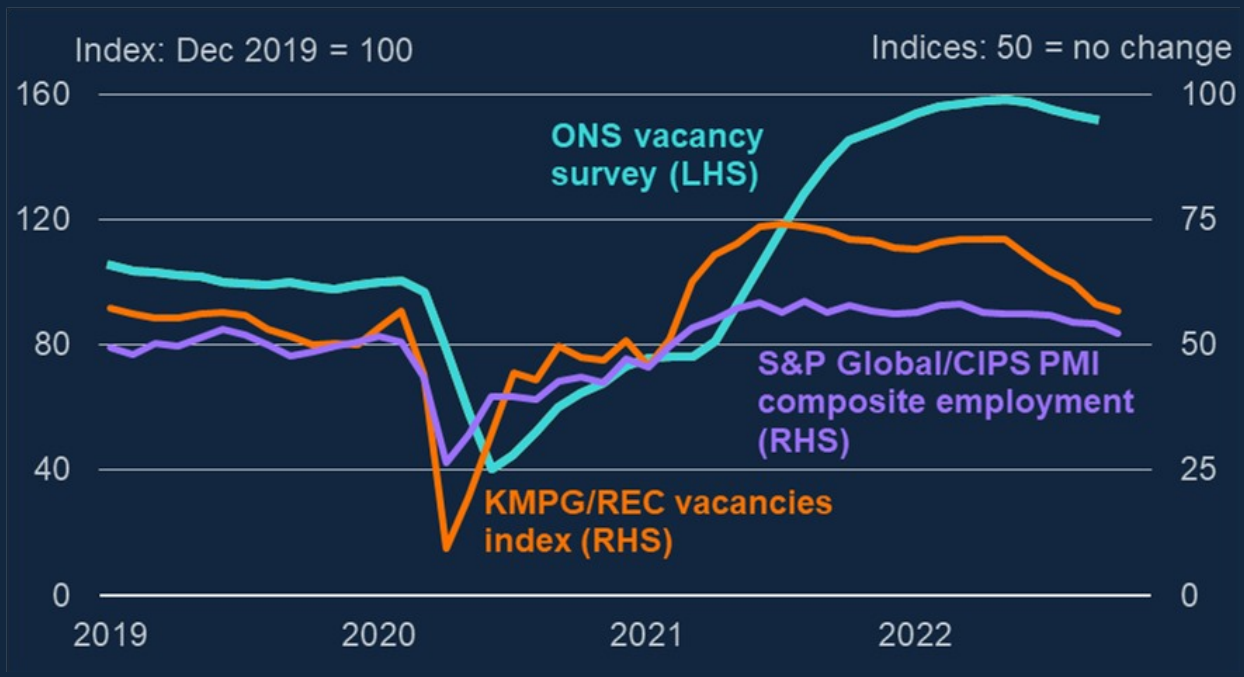
One factor behind the labour market tightening is the marked increase in the number of inactive people – those without a job and not actively seeking one. The UK stands out among most other developed economies in this respect. While the inactivity rate has fallen below its 2019 average in the median OECD country, in the UK inactivity remains above its level in 2019.[15] As much as three quarters of the increase in labour market tightness relative to pre-Covid can be accounted for by this rise in inactivity, which has been concentrated among people aged 50 to 64. Recent work by my colleague Jonathan Haskel suggests that it has been partly driven by an increase in long-term sickness.[16]

The tight labour market is one reason for high rates of pay growth. Private sector regular pay accelerated over 2022, with annual growth at 6.2% in the three months to August, well above target-consistent levels. Although real wages are still falling, it is likely that some of the increase in nominal wages also reflects second-round effects stemming from high headline inflation. For example, contacts of the Bank's Agents note that in addition to the tight labour market, inflation is increasingly a significant driver of pay awards. It is also possible that second-round effects are larger than otherwise because of a tight labour market. But it is difficult to disentangle these different drivers quantitatively – a tight labour market; second-round effects; or interactions

between the two.

Chart 4: Vacancies and employment indicators starting to weaken

Indicators of vacancies and employment (a)



Sources: KPMG/REC UK Report on Jobs, S&P Global/CIPS, ONS and Bank calculations.

(a) KPMG/REC series is the total vacancies index. ONS vacancy survey shows three-month averages.

How quickly wage growth falls back will depend both on the size of second-round effects, and on how quickly the labour market loosens. The labour market typically responds with some lag to changes in demand, so it is likely to be too early to see any effect of the downturn on unemployment. But in response to the recent and prospective falls in spending, there are now initial signs that the labour market is starting to loosen. A growing number of contacts of the Bank's Agents report pausing recruitment, for example. There are also firmer signs of a weakening in vacancies and employment survey indicators (**Chart 4**).

The response: fiscal policy

The impacts of the energy shock around the world have also led to large fiscal-policy responses. No policy can prevent sharply higher energy prices making energy importers, such as the UK, poorer. This is the unavoidable consequence of an increase in the price of the goods we import relative to those we produce. But policy can seek to smooth that impact over time, as well as to influence how the burden is distributed across the economy. Fiscal policy is the appropriate tool to

do this: it can be more targeted than monetary policy; and crucially for distributional decisions, it is carried out by representative governments.[17]

For monetary policy, the question, as always, is how much Bank Rate needs to respond to fiscal policy to ensure inflation remains on a path to 2% in the medium term. Normally, this would be relatively straightforward: fiscal policy is a textbook demand shock, and we understand well the plausible range of its effects on output and inflation. But the answer now is more complicated than usual, given the different nature of the UK Energy Price Guarantee (EPG) – and similar support schemes abroad – relative to typical fiscal news. Adding to this, in the UK there has been unusually high uncertainty in recent months about the overall fiscal stance. This has been both in light of and reflected in extreme volatility in markets. I will now discuss each of these complications in turn.

First, the EPG will have two-sided impacts on inflationary pressures, unlike standard tax cuts and spending increases. In the medium-term, the EPG offsets part of the energy-driven reduction in demand, by limiting the fall in real incomes. In that aspect it behaves in a similar way to an automatic stabiliser, mitigating disinflationary pressures. But in the near-term, as a price freeze, it also limits the peak in measured CPI inflation. We now expect this to rise to around 11% in Q4, compared to 13% in our August forecast.

By smoothing through the near-term peak in measured inflation, the EPG reduces the likely size of any second-round effects from headline inflation to domestic wages and prices.[18] This is true even though the UK as a whole is still paying the same for energy. That is because much explicit and implicit price and wage indexation in the economy depends on measured inflation rates, even if they do not capture the true economic cost for the whole economy.

As with energy price changes, monetary policymakers must judge which of these two effects is likely to have a larger impact on medium-term inflation. For my own part, my votes as energy prices increased have put weight on the impact from high near-term headline inflation on inertia. By partially offsetting these, the EPG allows us to focus more on the balance of demand and supply in the medium term.

Second, there has been far more volatility and uncertainty than usual around the overall fiscal stance. This has led to changes in my assessment of the appropriate setting of monetary policy, as the fiscal outlook has altered. At our September MPC meeting, it looked likely that there would be a significant fiscal loosening in the forthcoming Growth Plan. Given subsequent developments, it is now likely that the stance of fiscal policy will be tighter than I had previously assumed.

Third, monetary policy also has to consider the appropriate response to the extreme market volatility that took place around fiscal developments in recent weeks. While triggered by a fiscal event, this has clearly reflected changes in risk premia in UK assets, over and above the usual expected monetary response to changes in fiscal policy. Supporting this interpretation, sterling

and long-term interest rates moved in opposite directions. If the cause were instead monetary-policy expectations, the currency would tend to appreciate as rate expectations increased. Moreover, using standard fiscal multipliers, it would be hard to explain such a large movement in yields, especially as some of the plans were known in advance.

There have been many potential explanations expounded for why the risk premium on UK assets moved around so much over the past weeks. From my perspective, the precise source of these market moves is not of great importance. Whatever the cause, we can observe the moves in financial markets, and work out how they impact our forecasts for demand, supply and inflation. Those forecasts can then inform our policy decisions, as they did following the recent episode.

The response: financial markets

Volatility in UK financial markets over September and October was evident across different asset classes, but was particularly marked in pricing of sterling, and of UK government debt. Although risk premia have been an obvious UK specific driver, the moves also came in the context of increased volatility in global financial markets.

Chart 5: UK government bond yields rose sharply relative to others

Ten-year nominal government bond yields (a)

Sources: Refinitiv Eikon from LSEG and Bank calculations.

(a) Data to 9 November 2022.

The interest rate on 10 year UK government debt (gilts) increased by over 1 percentage point between September 22 and September 27 (**Chart 5**). Over subsequent weeks, it has retraced those moves entirely – falling back first after the Bank of England's intervention[19], and then further in response to political developments and announcements about changes in fiscal plans. Similar movements were evident in shorter maturity interest rates most relevant for UK household lending, while there was even more extreme volatility in longer-dated bonds, where liquidity issues were most acute. At the same time, the sterling ERI fell by 2.5% in a day on September 23, but despite a volatile period, had more than recovered by our November MPC meeting, and is now at around its pre-fall level (**Chart 6**).

Chart 6: Sterling fell sharply in September, but has since recovered

Sterling effective exchange rate index (ERI) and selected bilateral exchange rates (a)

Sources: Refinitiv Eikon from LSEG and Bank calculations.

(a) Data to 9 November 2022.

When considering how to respond to financial market moves, the MPC takes the actions necessary to return inflation sustainably to target. As an inflation-targeting central bank, we need respond only to the extent that they affect the inflation outlook. Neither gilt yields nor sterling are intermediate targets. Both impact inflation, but not identically to how monetary policy does. If we were to try to use monetary policy to implicitly target financial-market variables, that would therefore be at the expense of our inflation target, not in support of it.

So how should monetary policy respond to an increase in the risk premium, were it to re-emerge?

Monetary policy can do little about the risk premium itself. What we can do is set Bank Rate in a way that offsets its various impacts on inflation.

Taking each variable in turn, a higher risk premium on UK government debt increases longer-term government yields. These are mirrored in higher yields on UK corporate debt and reference rates for bank lending. These feed through to a higher price and lower availability of credit, as we saw in October. This tightening in credit conditions weighs on demand more than supply, reducing inflationary pressures. Such developments, all else equal, typically require looser policy than otherwise to leave inflation unchanged.

In contrast, a fall in sterling due to a higher risk premium pushes up on import prices, as well as providing a boost to demand from higher net exports. Both effects push up on inflation, so they require tighter policy than otherwise. But that does not imply aiming to restore the previous (or indeed any specific) level of sterling. If sterling assets are riskier, the exchange rate needs to adjust, and the role of the MPC is to manage that adjustment in a way that ensures 2% inflation, not to try to prevent it.

The same point applies to the recent strength in the dollar against sterling and most other currencies. One major reason for relative dollar strength is that the UK terms of trade – the prices of the goods and services we export relative to those we import – have worsened against the US, mainly because the US has not experienced as large an increase in energy costs (**Chart 7**). A worsening UK terms of trade implies the UK real exchange-rate must depreciate. This will happen via some combination of a nominal exchange-rate depreciation, which will increase import prices; or via a recession, which will generate the real depreciation by reducing domestic inflationary pressures.

Chart 7: The UK terms of trade have worsened against the US

Terms of trade

Sources: US Bureau of Labor Statistics, Eurostat, ONS, Refinitiv Eikon from LSEG and Bank calculations.

Avoiding any import-price increase, and forcing the entire adjustment to come through domestic prices, would be inconsistent with the inflation target. So a nominal depreciation of the currency is likely to form an inevitable part of the adjustment. Historical experience in the UK also points towards the dangers of trying to avoid an exchange-rate adjustment by following interest rates abroad, when economic trajectories are markedly different. At the same time, the other extreme, of ignoring import-price inflation entirely, would push inflation above target. To meet the CPI inflation target involves somewhere between the extremes: some import-price inflation, counterbalanced by weaker domestic activity and lower domestic inflation.

Rather than trying to offset movements in specific financial-market variables, inflation targeting involves aggregating them together to quantify their impact on the inflation outlook. One way of doing this is to look at financial conditions indices. These suggest that financial conditions have tightened considerably since our August forecast.

In our November forecast round, the MPC weighed these changes in financial conditions alongside other new developments, including in energy prices, the labour market and fiscal policy. That assessment then informs our current policy decisions, as well as any guidance over the path we anticipate will be needed for policy rates in future.

The response: tighter monetary policy

In response to the shocks seen over the past year, and taking into account the fiscal and financial market responses, the MPC has responded by tightening policy. We have judged that without increasing Bank Rate, the net impact of energy and the other shocks hitting the economy would have kept inflation above target in the medium-term.

The key question for me in recent months, has been whether we had tightened enough. Commentary often focuses on whether Bank Rate has changed at a particular meeting, or on the size of the change. But it is the level of interest rates that matters for businesses' plans and people's everyday spending decisions, and therefore for the impact on inflation.

Calibrating the required level of interest rates needs to take account of the rapid pace of tightening to date and the lag before its full impact on the economy. This is the fastest tightening in policy in the MPC's history, with interest rates rising almost 3 percentage points in 12 months.[20] Adding to that, the yield curve has steepened considerably, such that the tightening in financial conditions overall has been even larger, and even faster.

But with policy tightening so much, so quickly, inflation outturns today only reflect a small proportion of the impact already in train. The typical sequence of policy transmission is that higher interest rates first reduce spending, which then feeds through to lower labour demand and higher unemployment, and finally through to wages and prices. By the time that transmission has completed, a long time has elapsed, so the data we now observe depend on policy some months or years ago. There are some effects – particularly via the exchange rate – that reduce inflation more quickly, but most take longer. These lags are precisely why we use our forecasts to assess what policy is required to get inflation to target over the next couple of years.

My colleague **Ben Broadbent (2022)** recently showed that using the Bank's usual forecasting estimates, only around a quarter of the cumulative tightening had fed through to demand. So far, demand has indeed weakened, with the data suggesting the UK is likely to be in recession in Q4. This is partly the result of tighter policy, but so far, mainly the result of lower real incomes.

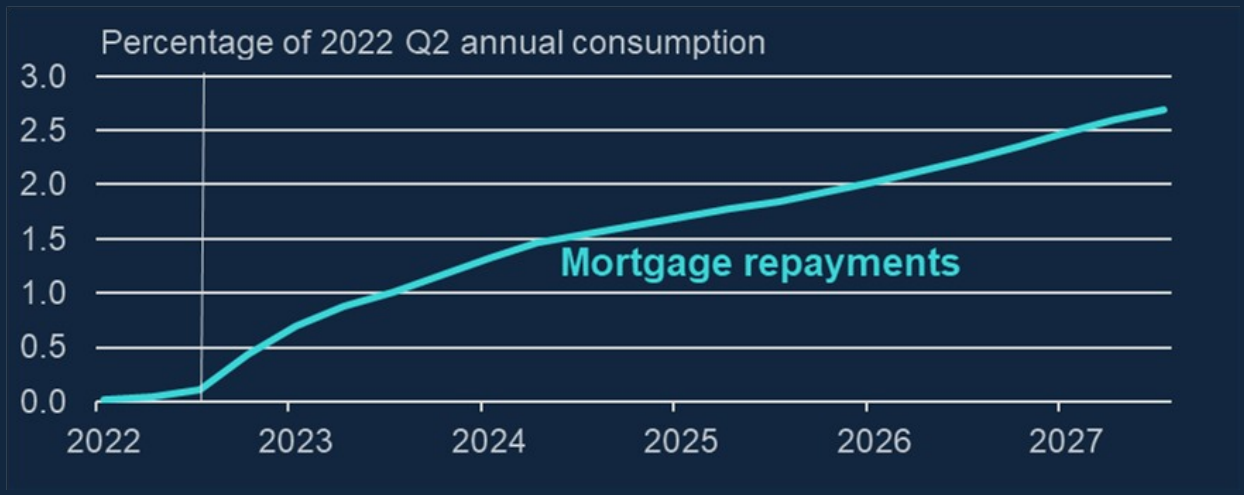
A key channel of monetary policy comes through mortgage lending and the housing market. Based on current market pricing, higher mortgage repayments alone will cause a significant slowing in the economy. And these impacts are likely to be more delayed than in the past, given the vast majority of mortgage debt is now on short-term fixed rates, rather than variable rates.

Chart 8 illustrates the scale and timing of these effects. It shows the change in total mortgage repayments as a share of consumption spending since the start of the year, if new fixed-rate mortgage rates were to stay at their recent peaks of around 6.5% indefinitely, and variable-rate mortgage rates were to rise gradually to the same level. In the experiment, by 2027, almost all 8 million mortgagors would have had to refinance at markedly higher rates. The increase in repayments would represent around 2.7% of annual consumption. But given the mechanical lags

in the process, almost all of those increases have yet to occur. Around 40% of the total would come through by the middle of 2023, rising to 80% by the end of 2025.

Chart 8: Vast majority of increase in mortgage repayments yet to come

Change in mortgage repayments as a share of consumption with mortgagerates at 6.5%, taking into account the distribution of mortgage terms (a)



Sources: ONS, FCA Product Sales Data, Bank of England and Bank calculations.

(a) Repayments from January 2022 to September 2022 are calculated using the effective stock mortgage rate and the stock of UK mortgage debt, both from Bank of England data. The average remaining term on outstanding mortgages is assumed to be 20 years. Repayment profile from October 2022 is calculated using the distribution of fixed deal terms from the FCA Product Sales Data. All fixed rate mortgages are assumed to reprice at 6.5% as soon as their fixed term is over; variable rate mortgages rates are assumed to gradually increase to 6.5%.

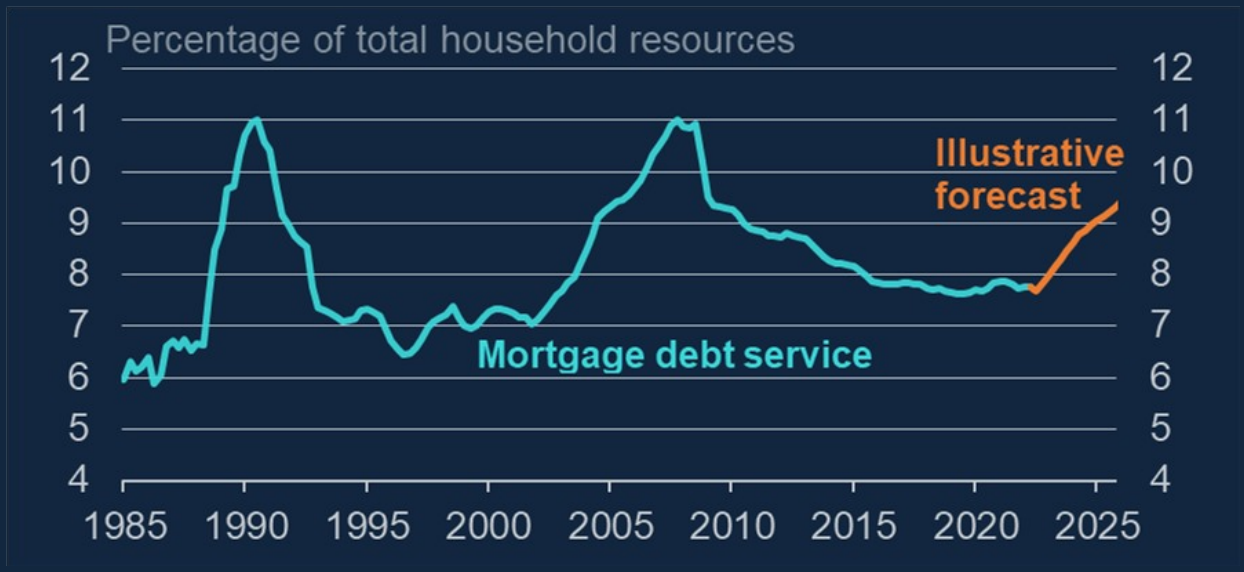
This experiment is illustrative, and is likely to overstate the eventual impact on consumption from this channel alone. Mortgage rates rose quickly in response to higher yields in September, but yields have since fallen from their peaks. The November MPC meeting minutes record that the majority of the MPC also expected that, if the economy was to evolve broadly in line with its forecast, Bank Rate would not be required to increase as much as was priced into financial markets. So we should expect mortgage rates to fall back somewhat from current levels. Borrowers also have other ways to adjust, and most will not reduce consumption one-for-one. Some will choose to reduce saving, or seek opportunities to earn more, while others may be able to lower their mortgage repayments by changing their terms, or paying down some of their loan.

However there are also reasons why there could be larger, or additional effects on consumption. The burden of higher mortgage payments will not be distributed equally, which increases the chances that those most affected cut back spending sharply. Past experience suggests that households tend to prioritise their mortgage repayments over all other spending, as occurred

during the 2008 financial crisis. Comparing to that period, the orange line **Chart 9** shows how aggregate mortgage repayments would change, as a share of current household income, under the same assumptions as **Chart 8**. At the economy-wide level, they would increase markedly, although would still not reach their 2008 peak. But that is partly because there are now fewer mortgagors than in the past. As a share of total mortgagor income, total repayments would reach around their 2008 peak over the next 3 years. Higher mortgage repayments will be compounded by the rise in energy costs, which has already been squeezing incomes.

Chart 9: Mortgage repayment burden would increase steadily at higher rates

Estimated UK household debt service ratio, illustrative forecast with mortgage rates at 6.5%, taking into account the distribution of mortgage terms (a)



Sources: ONS, FCA Product Sales Data, Bank of England and Bank calculations.

(a) Mortgage debt service ratio is mortgage repayment over household income. Mortgage repayment data from 1985 Q1 to 2022 Q2 are calculated using the effective stock mortgage rate and the stock of UK mortgage debt, both from Bank of England data. They are not adjusted for MIRAS. The average remaining term on outstanding mortgages is assumed to be 15 years. Repayment profile from 2022 Q3 onwards is calculated using the distribution of fixed deal terms from the FCA Product Sales Data. All fixed rate mortgages are assumed to reprice at 6.5% as soon as their fixed term is over; variable rate mortgages rates are assumed to gradually increase to 6.5%. Household income is total household resources (ONS code rpqk.q), and is held fixed from 2022 Q2 onwards.

Among the distribution of mortgage holders, there are also likely to be subsets who are particularly affected. There is a risk that those with high debt service ratios may respond by cutting consumption more sharply. These households tend to be younger, have lower incomes, and have lower savings to draw on. Those whose debt service ratios are pushed highest may get into repayment difficulties, or in the extreme, default.

Chart 10 shows how the distribution of these debt service ratios would change over the next two years if households refinancing had to do so at 6.5%. The metric here shows mortgage repayments as a proportion of income after payment of energy costs. For example, the rightmost bars show that the proportion of mortgagors paying over half of their remaining income towards their mortgage would triple to around 11%. The increase in the right tail of the distribution shows an increase in the number of households who would need to put very large shares of their income towards their mortgages, and struggle with repayments. But even at lower DSRs, a larger group of households would be likely to cut back their consumption sharply in order to afford higher repayments.

Chart 10: Mortgage repayment burden would increase steadily at higher rates

Distribution of mortgage debt service ratios, adjusted for energy costs, taking into account the distribution of mortgage terms (a)

Sources: ONS, FCA Product Sales Data, Bank of England, NMG Consulting and Bank calculations.

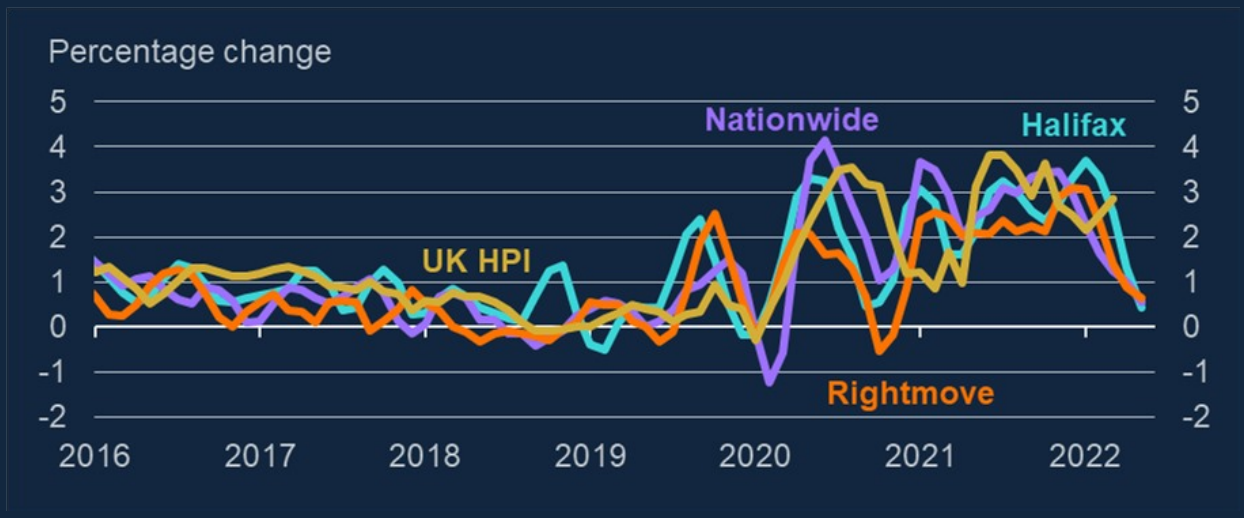
(a) Mortgage debt service ratio is mortgage repayment over household income less energy costs. Distribution of initial debt service ratios from the 2022 H1 Bank/NMG Household Survey. Changes in repayments are calculated using the distribution of fixed deal terms from the FCA Product Sales Data. All fixed rate mortgages are assumed to reprice at 6.5% as soon as their fixed term is over; variable rate mortgages rates are assumed to increase to 6.5% immediately. Household income is held fixed.

As well as the impacts on consumption, and even in the absence of large numbers of defaults, the reduction in affordability already appears to be affecting the housing market. There are signs that the rapid house-price increases of the past two years have started to reverse (**Chart 11**). To the extent that sellers are reluctant to sell at a reduced price, lower housing demand is likely to show up also in lower transactions, which will reduce housing investment and associated

consumption.[21]

Chart 11: House price indicators are weakening

House price inflation, three months on three months earlier (a)



Sources: Halifax House Price Index by IHS Markit, HM Land Registry, Nationwide and Bank calculations.

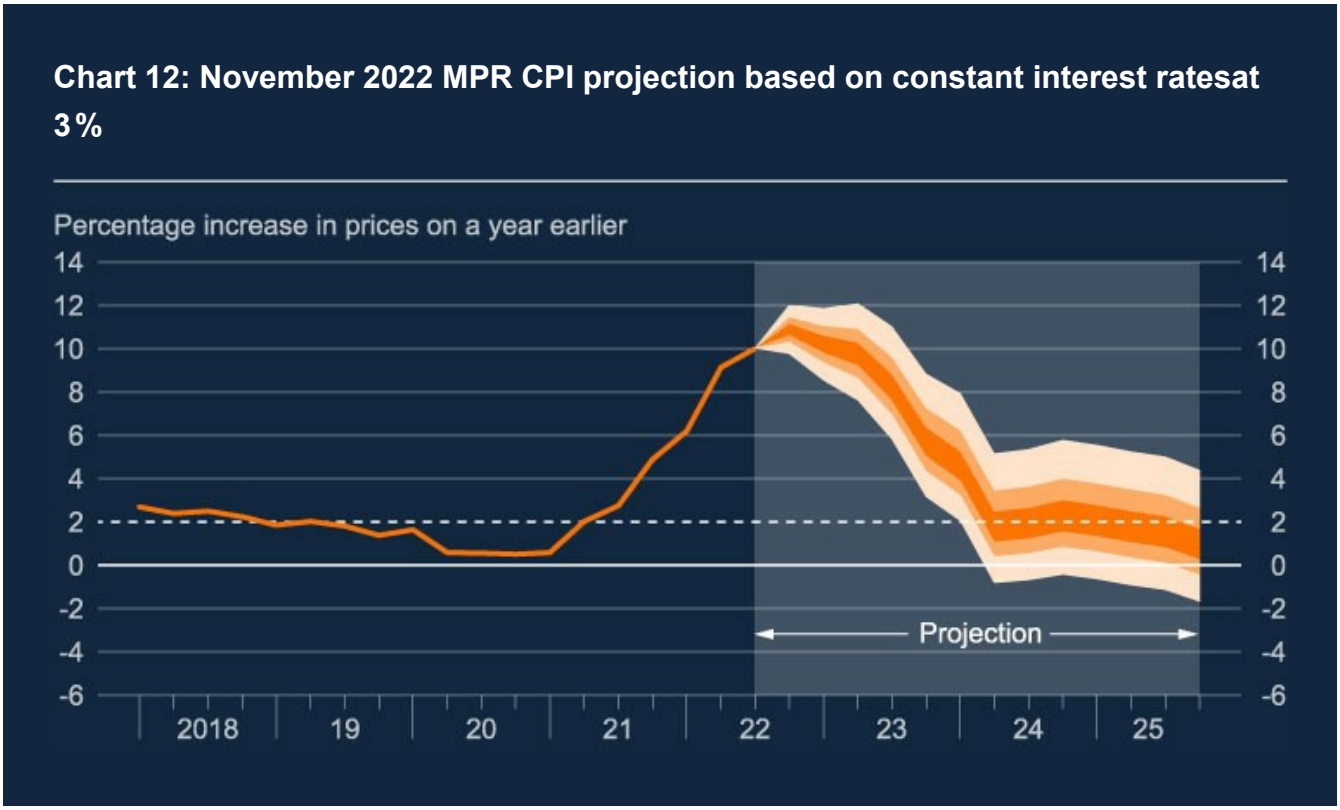
(a) Latest data point is October 2022 for Rightmove, Nationwide and Halifax, and August 2022 for the UK house price index. The Rightmove series is seasonally adjusted by Bank staff.

In the MPC's November forecast, if policy were to follow market-implied interest rates, these different housing-market channels, combined with the energy-price related falls in real income, would push the economy into a prolonged recession. Unemployment would rise significantly, driving further falls in real wage growth. And we would expect inflation to fall well below target in the medium-term, once the direct and indirect impacts of higher energy prices had dropped out of the inflation calculation. In the face of lagged impacts, we must look ahead to the effect of policy on the medium-term outlook for inflation. And given the outlook, I would view such a policy path as inconsistent with our target.

Policy outlook

To judge whether policy has tightened enough, one can also look at MPC forecasts that assume the policy interest rate is unchanged. **Chart 12** shows that with Bank Rate held at its new level of 3%, the MPC's modal forecast was for CPI inflation to fall back to target after 18 months, before falling further below target, to 0.8%, by the end of the third year of the forecast. The economy would still fall into recession, although this would be less severe, and demand would stay persistently below potential. Even at the previous level of Bank Rate at 2.25%, inflation was most likely to fall below target in the medium term.

Chart 12: November 2022 MPR CPI projection based on constant interest ratesat 3%



See footnotes in the November 2022 Monetary Policy Report.

These forecasts suggested to me that policy was already in restrictive territory ahead of our November meeting. And given the policy lags I have discussed, it had probably been restrictive for some time before. Moreover, since our convention is to only incorporate announced fiscal policy, those forecasts did not include any potential tightening in the fiscal stance. I judged that in the most likely scenario, we had already done enough to bring inflation rapidly back to, and then below target. Despite that, I voted in November for a further 0.25 percentage point increase in Bank Rate, to 2.5%.

My main rationale for a further tightening was risk management. While forecasts are essential to forward-looking policy, they are also inherently uncertain. Most obviously, our inflation forecast is highly dependent on the path for energy prices. But we also face two key uncertainties over how quickly and how far domestic wage and price inflation will weaken. First, over the scale of second-round effects stemming from very high headline inflation. If there is more price and wage inertia than we expect, this will make domestic inflationary pressures slower to fall back when energy prices stop rising.

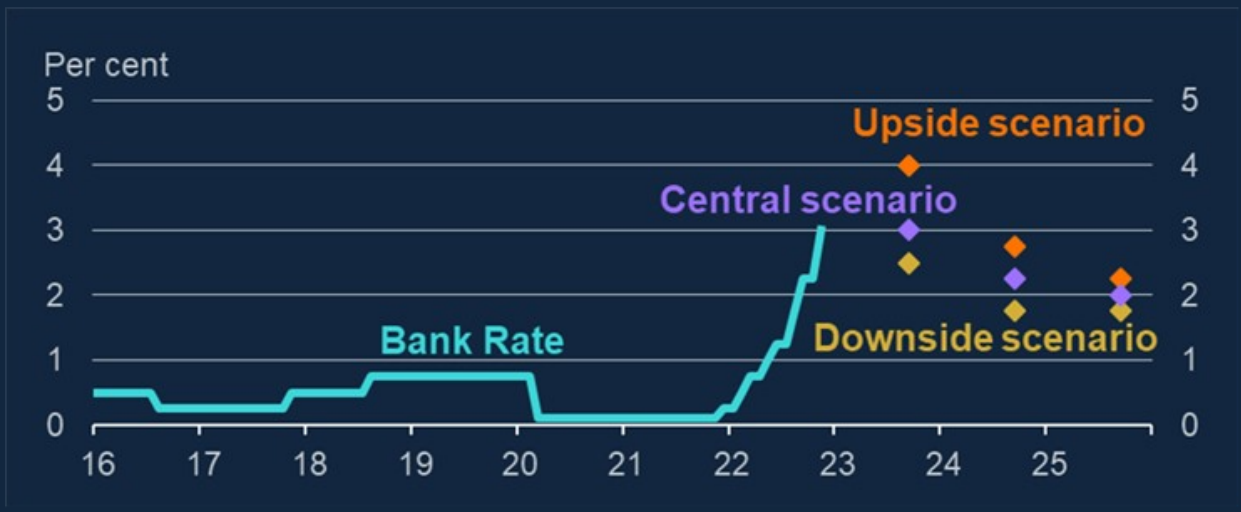
Second, while we can now see demand weakening in the data, there remains uncertainty about exactly how that will affect the labour market and inflation, which, based on past evidence come later in the transmission chain. Output has fallen, including for services, and business and

consumer indicators are consistent with the economy having entered recession. We are also now seeing some signs of that feeding through to labour demand. But it is too early to judge whether the labour market will loosen and wage growth and services price inflation will fall back exactly as in our forecast. For the moment, the labour market remains tight, and domestic cost pressures remain well above target-consistent levels.

Given those uncertainties, I judged in November that there was a case for tightening further into restrictive territory, to guard against the risk that inflation does not fall as far or as quickly as I expect. The majority of the MPC voted in November for a larger rate increase to 3 per cent. From my perspective, with the policy stance tightened further into restrictive territory, I expect this risk management rationale to be weaker in future months. The higher is the level of interest rates, the lower are the chances of tightening too little, and the further below target inflation could fall in the medium term.

To illustrate more firmly the ways in which my view of the required policy might evolve, **Chart 13** presents some interest rate paths, under three different stylised scenarios. These show my own judgements on what strategy might be required, depending on how the data evolve, rather than any model-based results. I would stress that these reflect only my own individual expectations and assessment of risk, and not those of the committee as a whole. Even if one of these scenarios were to come to pass, I only have one of nine votes, and as in November, mine may be in the minority. And given my term on the MPC will finish in the middle of next year, some of these votes will be cast by my successor.

Chart 13: Scenarios for future Bank Rate



The central scenario represents what I think would be required if the economy were to evolve broadly in line with the MPC's November MPR forecast. I would expect that Bank Rate held at 3%

over 2023 would reduce output further below potential, given the effects of lower real incomes and the lagged impact of the tightening to date. Policy would then have to loosen, perhaps in 2024, to try to prevent inflation falling below target.

In the other two scenarios I assume that demand conditions evolve in a similar way, but that there are differences in how that feeds through to inflation. The upside scenario shows how my votes could evolve if demand weakness does not feed through into a looser labour market as in our forecast, or if high-frequency readings of domestic wage and price pressures accelerate, rather than fall back. Policy would have to tighten further to ensure the downturn was large enough to bring inflation back to target. I would anticipate this scenario would create a larger demand shortfall and medium-term inflation undershoot, and policy may have to cut rates more aggressively in 2024, once inflation had fallen back.

Finally, the downside scenario assumes that we see a faster and deeper turnaround in the labour market, wage growth and inflation, such that Bank Rate is cut earlier, at some point in 2023.

Under any scenario, and whatever new shocks affect the economy over the next few years, the goal will be unchanged. Policymakers will need to find the appropriate path, sustainably, to the 2% target.

I would like to thank Jenny Chan, Derrick Kanngiesser, Michael McLeay, Alberto Polo, May Rostom, James Tasker, Ryland Thomas and Lukas von dem Berge for their help producing this speech. I am also grateful to Andrew Bailey, Sarah Breeden, Fabrizio Cadamagnani, Julia Giese, Richard Harrison, Jonathan Haskel, Josh Martin, Huw Pill, Marek Rojicek, Andrea Rosen, Martin Seneca and Fergal Shortall for helpful comments.

---

1. Another substantial share, including the initial pick-up in inflation, can largely be accounted for by the large increase in globally traded goods prices, captured in core goods. This has been related to both the reopening from the pandemic, and the large fiscal stimulus in many countries, particularly the US. See **Tenreyro (2021)** for a discussion.
2. The speed of this pass-through will depend on the OFGEM cap, and on the details of the government's Energy Price Guarantee (EPG).
3. Of which 3.6% is electricity, gas and other fuels, with the rest being largely petrol.
4. The energy-price change varies from month to month, and was 50% in September, but was expected by to have increased to nearly 60% in October.
5. See **Tenreyro (2022)** for a discussion.
6. The arguments would be different if movements in energy prices were known in advance. But energy-price shocks are almost never forecastable, let alone when they are driven by an unexpected war. Even hypothetically, if we had known in advance, offsetting all of the current shocks on inflation would have required us to increase interest-rates and unemployment to double-digit rates at the height of the pandemic, all while the global policy effort was focused on trying to protect jobs and avoid unnecessary business closures.
7. It is also possible that after a long period away from target, medium-term inflation expectations could drift away from

those consistent with 2%. I judge that these expectations are well anchored, and by bringing inflation back to target in the medium term, the MPC can ensure they remain so.

8. Blanchard and Galí (2007), '**Real Wage Rigidities and the New Keynesian Model'** show that in the presence of real wage rigidities an energy price shock works much like a trade-off inducing cost-push shock.

9. See Harrison, Thomas and de Weymarn (2011), '**The impact of permanent energy price shocks on the UK economy**' for a full discussion of this channel in response to a permanent energy-price shock.

10. Chan, Diz and Kanngiesser (2022), '**Energy Prices and Household Heterogeneity: Monetary Policy in a Gas-TANK**',

11. The channel can still be present in net exporters too, for example if it redistributes incomes away from households with higher marginal propensities to consume. The US has also been much less exposed to the fluctuations in energy prices related to the Russian invasion of Ukraine.

12. There is also evidence that the inflation perceptions of some households and firms are particularly influenced by highly visible prices, such as energy and food, rather than the aggregate inflation rate. See **Tenreyro (2019)** for a discussion. Since monetary policy has only a very limited effect on these prices, it is unlikely to be able to prevent second-round effects coming from the impact of energy and food prices.

13. See **Pill (2022).**

14. It is not an objective of monetary policymakers to decide how real income gains or losses are distributed. Taking as given those distributional decisions between workers and firms, monetary policymakers need to set interest rates to ensure inflation comes back to target.

15. See **Haskel (2022)**.

16. Haskel and Martin (2022), '**Economic inactivity and the labour market experience of the long-term sick**'.

17. The persistence of the energy-price shock will determine the extent to which the government can smooth its impact over time.

18. Whether those additional second-round effects are avoided entirely, or simply postponed until headline inflation is weaker, will depend on the path for energy prices after the EPG closes, on the process through which high headline inflation causes inertia, and ultimately, on monetary policy.

19. See **Breeden (2022)** and **Hauser (2022)** for discussions of the Bank's intervention and the threat to financial stability that motivated it.

20. Some have argued that given increases in inflation, the aggregate real interest rate has nonetheless fallen, and therefore the policy stance remains loose. This would be the case if high inflation or inflation expectations were increasing demand through intertemporal substitution. But the aggregate inflation rate is not likely to be the relevant one for this channel. It is not possible to substitute energy use over time, so higher energy prices will depress demand rather than increase it. The inflation rate and expected inflation in goods and services that are substitutable over time is likely to be far lower.

21. See Bracke and Tenreyro (2021), '**History Dependence in the Housing Market'** for evidence.

Silvana Tenreyro

Member of the Monetary Policy Committee