# The inflationary consequences of real shocks – speech by Ben Broadbent

Given at Imperial College, London

20 October 2022

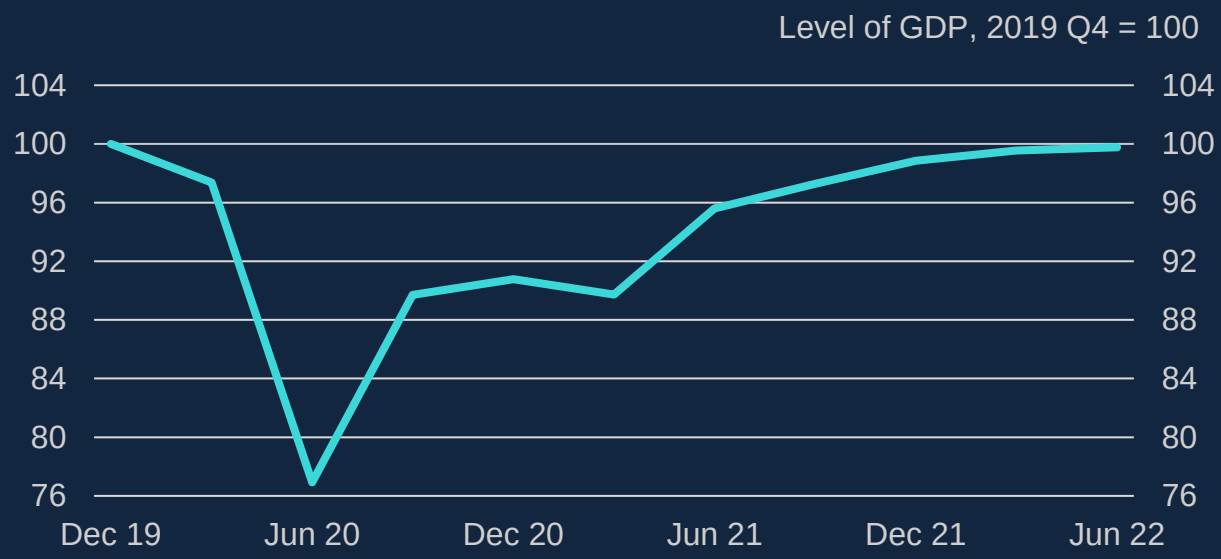
# Speech

## Introduction and summary

Between them, the Covid-19 pandemic and Russia's invasion of Ukraine have inflicted significant damage on the UK's national income. Today I want to look at the link between these extraordinary shocks, the very high rates of inflation that have followed and the response of monetary policy. I will also draw one particular contrast with the potential response to easier fiscal policy.

I'll kick off with the slightly less dramatic topic of national accounting identities. One of the first things you get taught in macro-economics is that national income is equal to national output: in principle GDP measures both these things, as well as aggregate demand. Accounting identities of this sort don't tell you anything about what causes what as they're true by definition (though it's useful to understand that we earn only what we produce and sell). But you might at least think, given the recovery in whole-economy output in the eighteen months since (Chart 1), that the worst of the drops in national income during the pandemic are well behind us.

**Chart 1: GDP just about back to pre-pandemic levels**




Source: ONS and Bank calculations.

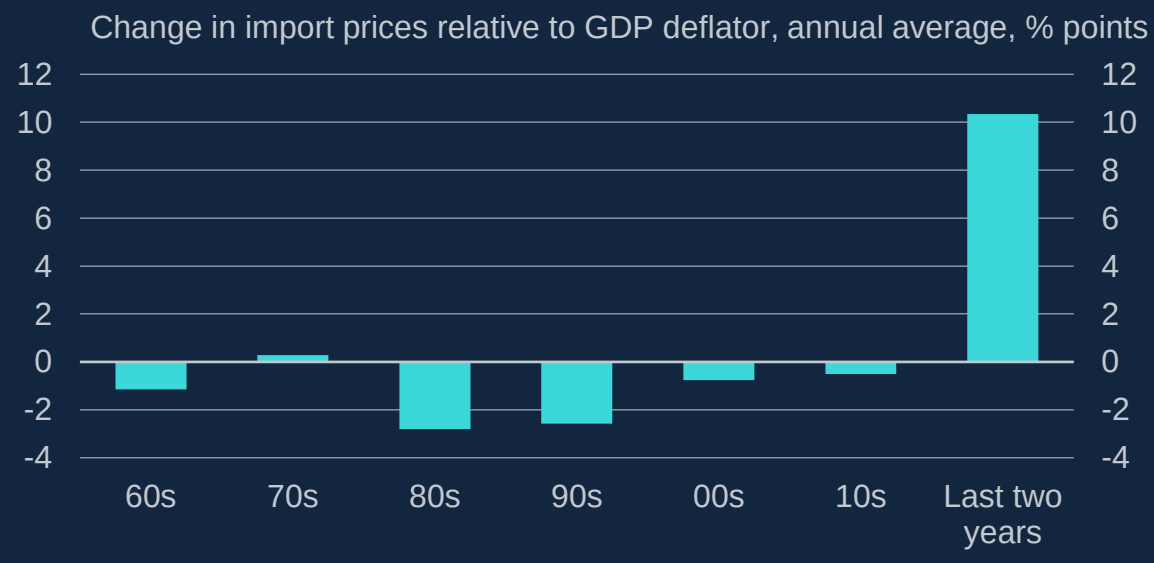
However, while the accounting equality of output and income is valid in nominal (i.e. cash) terms, and more generally in closed economies, it's not always the case in real terms and for open economies. When we're able to trade with other countries we no longer have to

consume and produce the same things. This means output and consumer prices can diverge. And movements in that relative price will affect the real consumption value of what we collectively produce even if its quantity (GDP) doesn't change. If you produce apples but consume oranges you'll be better off when the price of oranges falls (relative to that of apples), worse off if the opposite happens. It's not that domestic output and productivity don't matter for income: obviously they do. But movements in relative prices matter too, and there are times when they matter a lot.

In the real-world UK economy, one of the big differences in this respect involves energy and other physical goods. Collectively we consume a lot more of these things than we produce. The UK is a big net importer of (non-energy) goods. And although the North Sea is still providing quite a bit of oil and gas, here too the UK runs a significant deficit. Besides, only a very small minority of UK residents actually receive any disposable income from that source. Notionally "British" companies operating in the North Sea have significant foreign ownership. What domestic shareholdings do exist are likely to be held mostly in pension funds and other long-term (i.e. inaccessible) investment vehicles.

This means that, for given GDP, rises in the relative prices of goods and energy make us collectively worse off. And that's exactly what's happened over the past couple of years, thanks first to the pandemic and then Russia's cut in gas exports. Over that period the price of the UK's imports has risen by 20% more than the average price of its output. You can see this in the last bar in Chart 2.

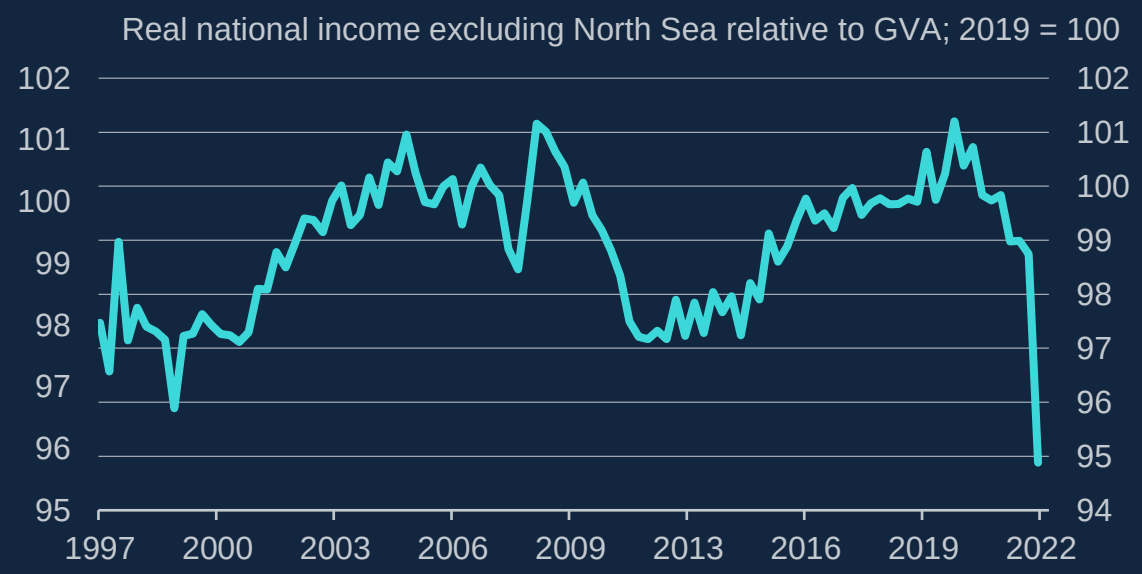
**Chart 2: Bucking the long-term trend, import prices have risen much faster than output prices over the past couple of years**




Source: ONS and Bank calculations.

As a result, real income for the non-North Sea economy as a whole – how much our collective output is actually worth, in consumption terms – has fallen by over 5% since the end of 2019 (Chart 3).

**Chart 3: Real income has therefore fallen steeply relative to output**




Real national income excluding North Sea calculated as (Nominal GVA – North Sea profits) / Consumption deflator. Sources: ONS and Bank calculations.

This may not be completely unprecedented but it's pretty unusual. As you can see from the earlier bars in Chart 2, the post-war trend has been the opposite: compared with that of aggregate output, the average price of goods – and therefore of UK imports in aggregate – has tended to decline[1].

At times this has added significantly to real income growth. During the "noughties", for example, the integration of China into the global trading system depressed global goods prices markedly. This wasn't such a great thing if you were a manufacturer in the west, competing with this new source of production. Net buyers of goods, on the other hand, were made better off. Real household income outgrew GDP by a cumulative 7 % points during that decade.

[1] In part this reflects productivity improvements in the distribution sector. In the mains it's because productivity tends to rise faster in goods production than in services. The technology for making cars and computer chips improves more rapidly than those for cutting hair, designing software or providing insurance. The result is that relative employment, production costs and prices all tend to decline in manufacturing. This helps to explain why the UK has had weaker productivity growth than some economies with a larger industrial sector. But the higher share of services in UK exports has also tended to mean relative prices move in its favour. In general – the last couple of years providing one very clear and egregious exception – what is lost on one front is made up for on another.

Clearly – and with a vengeance – the early part of this decade has seen a sharp reversal of these trends. In the third quarter of this year, UK GDP will probably be only slightly below where it was in the last quarter of 2019, immediately before the pandemic. Yet real household income is likely to be over 3% lower, with real corporate profits down by more than 5% (around 10% if you exclude the North Sea).

It's understandable, faced with this extraordinary squeeze, that people and firms in the UK economy have sought to protect their real incomes – whether pay or profits – through compensating rises in wages and domestic prices. Unfortunately, and at least collectively, those efforts will not make us better off. It's not as if one group or sector is worse off only because another, within the (non-North Sea) UK, is better off. The rise in import costs has depressed the purchasing power of the country as a whole. So all that can be done is to shift the losses from one place to another. And in the process, without any lasting impact on real incomes, the result is simply higher growth of nominal pay and prices. These are the "second-round effects" (of higher import prices on domestic inflation) to which monetary policy is having to respond.

Today, I want to make three points about this process.

First, monetary policy cannot undo the hit to real income. Nor could it ever have done. One often hears that people are worse off "because of inflation". This is not quite right. Implicitly, it presumes that monetary policy could have prevented prices from rising so fast without doing anything to nominal incomes. Unfortunately, that's not the case. Even assuming policy had been tightened sufficiently aggressively, and sufficiently early, to have knocked eight percentage points off the current rate of inflation, it would also have depressed nominal income growth by at least as much and almost certainly quite a bit more. Unemployment would be materially higher and nominal wage growth materially lower. Ultimately, this reflects what is known as the "neutrality" of monetary policy: in the long run it has no impact on real economic variables (things like real output or relative prices). It can't boost structural productivity, for example. Nor can it offset the consequences for real incomes of (say) disruptions to supply chains in Asia or Russia's curtailment of the supply of gas to Europe. Indeed, in the first instance, at least for a period of time, tighter monetary policy lowers GDP and real incomes. I will say more about this shortly. For the time being, a better short-hand description is this: the pandemic and the war have led jointly to higher inflation and lower real incomes; the MPC will ensure the inflationary effects do not persist into the medium term; but the real-income hit exists either way, and will be reversed only to the extent the underlying shocks themselves go away.

The second point I want to make is that we are inevitably having to learn, to some degree, about the scale of these "second-round" effects. The MPC has raised interest rates faster than at any time in its history but obviously more gradually than inflation itself. In the main, this is because the direct effects of the jumps in traded goods and energy prices, as violent

as they are, are likely to fade before policy could really do much about them. The exact timing and scale of the peak rate of retail energy price inflation will obviously depend (amongst others) on the nature and duration of government support. But in the absence of further (and equally steep) rises in wholesale gas prices, and even without any such support, inflation in retail energy bills is likely to be materially lower a couple of years from now than it is today. Inflation in the areas most affected by the pandemic seems already to have peaked.

However, it's also because we are relatively unfamiliar with the second-round effects of these things. They very clearly existed in the past, before inflation targeting was put in place in 1992. Economists long recognised that, in the presence of "real income resistance", negative shocks – from, say, higher import prices or higher taxes – could generate inflation in wages and domestic prices. Estimates of these effects using the historical data, from before the 1990s, were reasonably sizeable. But they then began to decline, a phenomenon many attributed to greater flexibility in the labour market. So although there were occasions after 1992 when real incomes were squeezed – the big rise in import prices immediately after the financial crisis was one obvious case, so too perhaps the period of weak productivity growth that followed – there was very little sign of any second-round response of domestic inflation.

Absence of evidence is not the same as evidence of absence. Given the enormous scale of the rise in import prices it would have been surprising to see no impact whatever on domestic inflation, particularly against the backdrop of a very tight labour market. But it's unavoidable that we are having to learn about these effects, and to respond to them, as they emerge. Unlike the more volatile movements in tradable goods prices, shifts in domestic inflation tend to persist for longer and it will require a period of below-trend growth in demand to bring inflation back towards target-consistent rates. Because they've depressed real incomes, that slowing in demand will to some degree follow from the very same rises in import costs that have pushed up headline inflation. But monetary policy needs to be tightened as well.

My third point is that the response to a pure demand shock – say from easier fiscal policy – is rather different in this respect. We can be less uncertain about its effects, there's less reason to wait till they actually come through and one would therefore expect a more immediate reaction.

For as long as it's in place, the government's Energy Price Guarantee has the effect of limiting headline inflation and, to that extent, any related strengthening of second-round (and more persistent) effects on domestic inflation. By the same token, however, it mitigates the severity of the hit to household incomes and thereby supports domestic demand. As the Committee noted last month, this would – all else equal – add to inflation

in the medium term. And, compared with the forecast we had in August, the MPC has judged that the second effect is likely to outweigh the first.

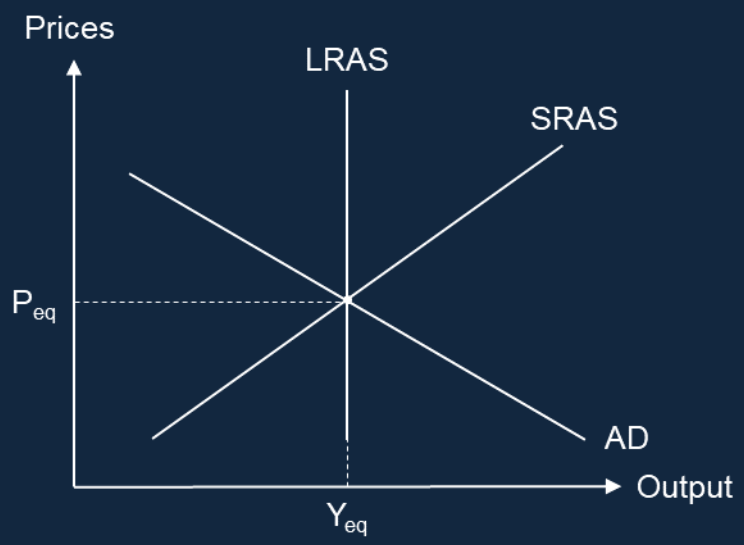
There is uncertainty about the nature and duration of these subsidies. The government has now said the current scheme will now last only six months, rather than two years, but that some form of support is likely to be provided thereafter (albeit on a more targeted basis). The MPC will take account of any fiscal news in the forthcoming Medium-Term Fiscal Plan, as well as any other news relevant for the medium-term inflation outlook, in its next set of forecasts.

Anyhow, having laid out already the main points I want to make, the rest of the talk fills in some of the details. I'll start with a discussion of monetary "neutrality", explaining why policy cannot in the long run offset the income effects of real economic shocks, including those from the pandemic and the war. I'll then go over briefly the historical evidence about "second-round effects", putting the current experience into context. The final section covers the potential response to the recent fiscal announcements. I'll also touch briefly on the very marked rise in the expected path of interest rates, beyond the MPC's next meeting, priced into financial markets.

## Monetary neutrality: why we can't escape the hit to real incomes

If you open an A-level economics textbook one of the first things you'll see is something like Chart 4. The "AS" (aggregate supply) lines trace out the response of output and prices to a change in aggregate demand (represented by a shift in the "AD" line), for example from a change in the stance of monetary policy.

**Chart 4: Monetary policy only affects real variables for a while**




In the short run the supply curve is upward sloping ("SRAS"), so stronger demand can raise output as well as prices. This is more or less the relationship that A.W. Phillips had uncovered, using pre-WWI British data, in his 1958 paper[2]. But students are also taught that, over time, once prices adjust in full, there is no effect of monetary expansions on real output. The long-run Phillips curve – here labelled an aggregate supply ("LRAS") relationship – is vertical.

The idea that money is "neutral" – that it has no enduring impact on real output or incomes – goes all the way back to David Hume, in the mid-18th century. It also makes intuitive sense, I think. Most people would instinctively understand that one cannot permanently enrich a country simply by dolling out more banknotes. In the end, all that would do is to raise all prices and wages equiproportionately and nothing real would be affected. As far as the theory is concerned, this is pretty much guaranteed in any formal description of the economy as long as (i) people are assumed to care about real not nominal things – what their wages can actually buy, not just what they're worth in pounds or dollars – and (ii) prices are ultimately flexible.

But for a while, in the immediate aftermath of Phillips's paper, the point was temporarily forgotten. His eponymous curve was commonly interpreted as some unchanging, structural relationship, one that seemed to offer a long-run choice between controlling

[2] Phillips (1958), 'The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861–1957'. Economica. Phillips actually estimated the relationship between wage growth and unemployment – what is now called the "labour market Phillips curve". The plain description "Phillips curve" usually refers to the equivalent relationship between output and price inflation. Gali provides theoretical foundations to Phillips' empirical relationship in his 2011 paper 'The return of the wage Phillips curve'.

inflation and boosting real activity and incomes. If a country was prepared to tolerate a slightly higher rate of inflation it could (on this view) generate a permanent rise in its real income.

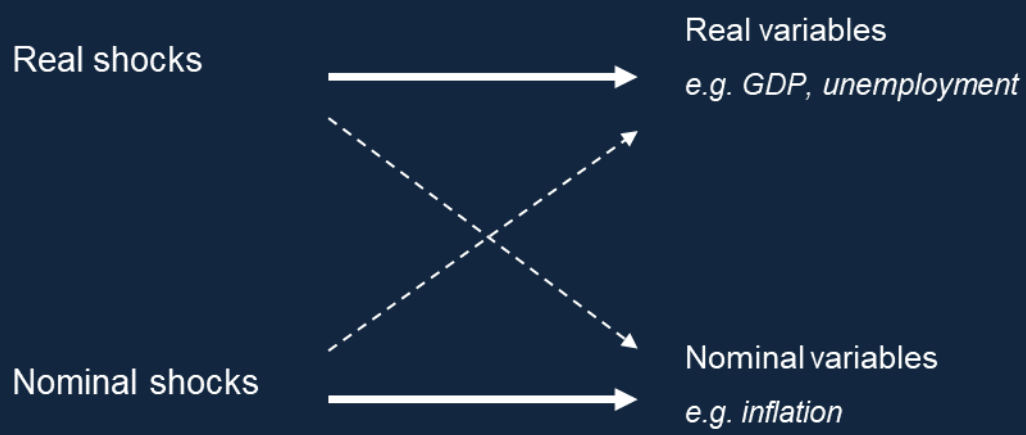
It was Milton Friedman, in his famous 1968 presidential address to the American Economic Association[3], who brought people back to earth. It was true, he said, that monetary expansions could boost activity and employment for a while. But this effect relied on people mistaking nominal for real wage increases and therefore couldn't last. "There is a temporary trade-off between unemployment and inflation; there is no permanent trade-off".

Friedman's main concern was to point out the fruitlessness (not to say danger) of asking the monetary authority to target or "peg" some arbitrary rate of economic growth or the level of unemployment. These are real things that cannot ultimately be affected by monetary policy: "The monetary authority controls nominal quantities…and can use this control to peg [another] nominal quantity – the exchange rate, the rate of inflation, the rate of growth of nominal national income. It cannot use [monetary policy] to peg a real quantity – the real rate of interest, the rate of unemployment, the level…or growth rate of real national income".

For our purposes, the important implication of this conclusion is that if something else shifts those "real quantities" monetary policy cannot offset it. The picture in Chart 5 is one (very high-level) way of representing this "dichotomy" between real and nominal things. The left-hand column divides the original, underlying drivers of the economy in two, the right-hand side does the same for economic outcomes. Solid lines represent long-run, permanent effects, dotted lines temporary ones. The key point is that the long-run channels run purely horizontally: over time, monetary shocks (including from monetary policy) can only affect nominal outcomes; enduring changes in real things – productivity, real incomes, any relative price – can only have been caused by real disturbances[4].

[3] Friedman (1968), 'The role of monetary policy'. American Economic Review.
[4] In their 2020 paper 'The long-run effects of monetary policy', Jorda, Singh and Taylor report results suggesting that overtight monetary policy can have long-lived effects on output via lower investment and capital accumulation (so-called "hysteretic" effects). But I don't think the authors would claim that easy monetary policy, and high inflation, would boost long-run output (the effect would be asymmetric). In his Nobel prize lecture Lucas (1995) suggests that, in some circumstances, when money is the only store of value, you might even expect the long-run Phillips curve to slope backwards, as the inflation "tax" reduces the return to saving.

**Chart 5: In the long run, real things are unaffected by nominal shocks**




The fact that the relative price of energy has gone up so steeply in Europe has a real cause: Russia's curtailment of the supply of gas. The same goes for the steep rises in prices of non-energy goods that came before, during the course of 2021. Because it prompted a shift in consumer spending towards goods, while at the same time impairing their supply, the pandemic pushed up the relative prices of things like computers and cars. As we saw in the introduction the result of these shocks has been a steep rise in the price of what the UK consumes relative to what it produces. That inevitably depresses real incomes, regardless of the path of monetary policy and overall inflation.

This is why I think it's misleading to say that real incomes have fallen "because of inflation". The phrase "cost of living crisis" is closer to the truth. Closer still is this: the war and pandemic have directly and inescapably depressed real incomes; they have also, for a time, raised domestic inflation; the MPC will ensure the phenomenon is temporary; but the real-income consequences of these shocks exist either way (unless and until they're reversed).

## Second-round effects: how hits to real income can result in domestic inflation and how monetary policy responds

Having discussed the real consequences of these big shocks I'll now say a word about their nominal effects (the higher of the two dotted lines in Chart 5). How is it that a rise in import prices can create upward pressure on domestic inflation and what do we know about the scale of these "second-round effects"?

This has been a critical judgement for monetary policy. Prices of tradable goods are volatile and their direct contribution to overall inflation tends not to last that long – a shorter

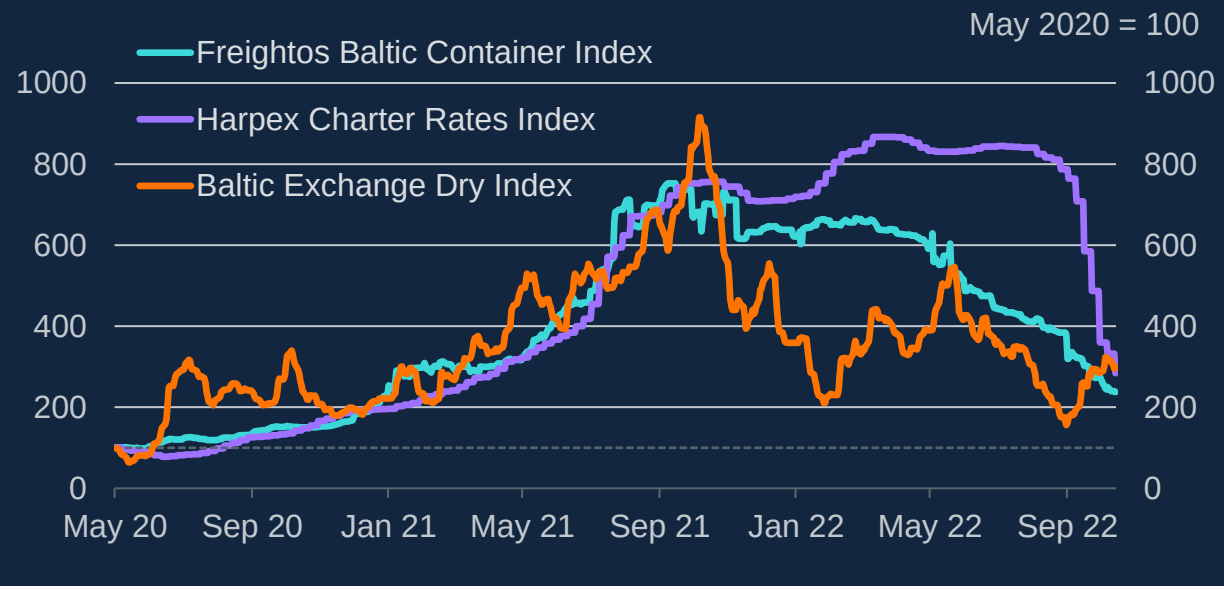
time, in particular, than it takes for monetary policy to have a significant effect of its own on inflation.

The classic example is a change in oil prices. The direct effects on the CPI, most directly on petrol prices, come through quite quickly. Equally (and unless the price of oil keeps rising) that also means they drop out of the annual rate of inflation after a year or so. That's too short a time for monetary policy to have much effect.

Prices of other, non-energy traded goods aren't quite as volatile, their direct effects take longer to feed through and therefore affect the overall rate of inflation for longer. But they're still unlikely to have that much of an impact a couple of years ahead, the sort of timescales it takes monetary policy to have its peak effects. So although the pandemic was clearly much less disinflationary than central banks and other forecasters had predicted – the demand-shifting and supply-impairing effects on goods prices were very significant – it nonetheless seemed likely at the time that these effects would dissipate, along with the virus itself, within that medium-term horizon.

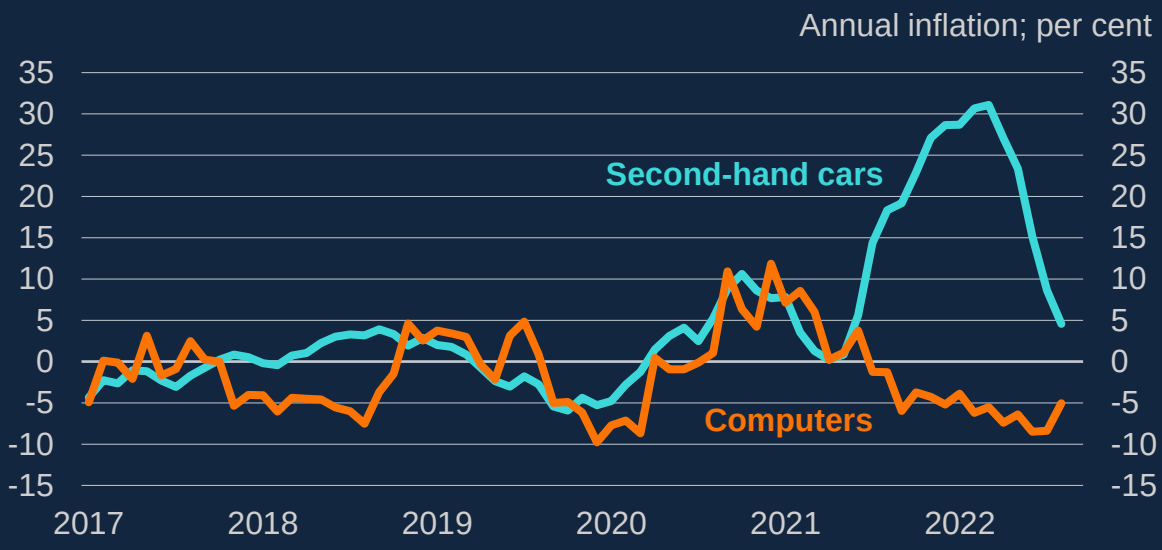
I think there are some signs this has begun to happen. One of the higher-profile effects of the pandemic was a dramatic rise in the cost of shipping. Also well reported were the steep rises in prices and delivery times for computer chips and the cars on which they rely. In all three cases rates of inflation have fallen back markedly over the past few months (Charts 6a and 6b).

**Chart 6a: Shipping costs have fallen steeply in recent months**




Source: Refinitiv, Baltic Exchange, Freightos Baltic Index (https://fbx.freightos.com), Harper Petersen and Bank calculations.

**Chart 6b: Inflation in prices of cars and computers has also turned out to be transitory**




'Computers' refers to ONS code for 'data processing equipment'. Source: ONS and Bank calculations.

However, there was always the risk that big rises in traded goods prices might prompt faster inflation in its more persistent, domestic components, including nominal wages. This would have a bigger impact on forecasts of inflation at policy-relevant horizons and clearly merit a response.

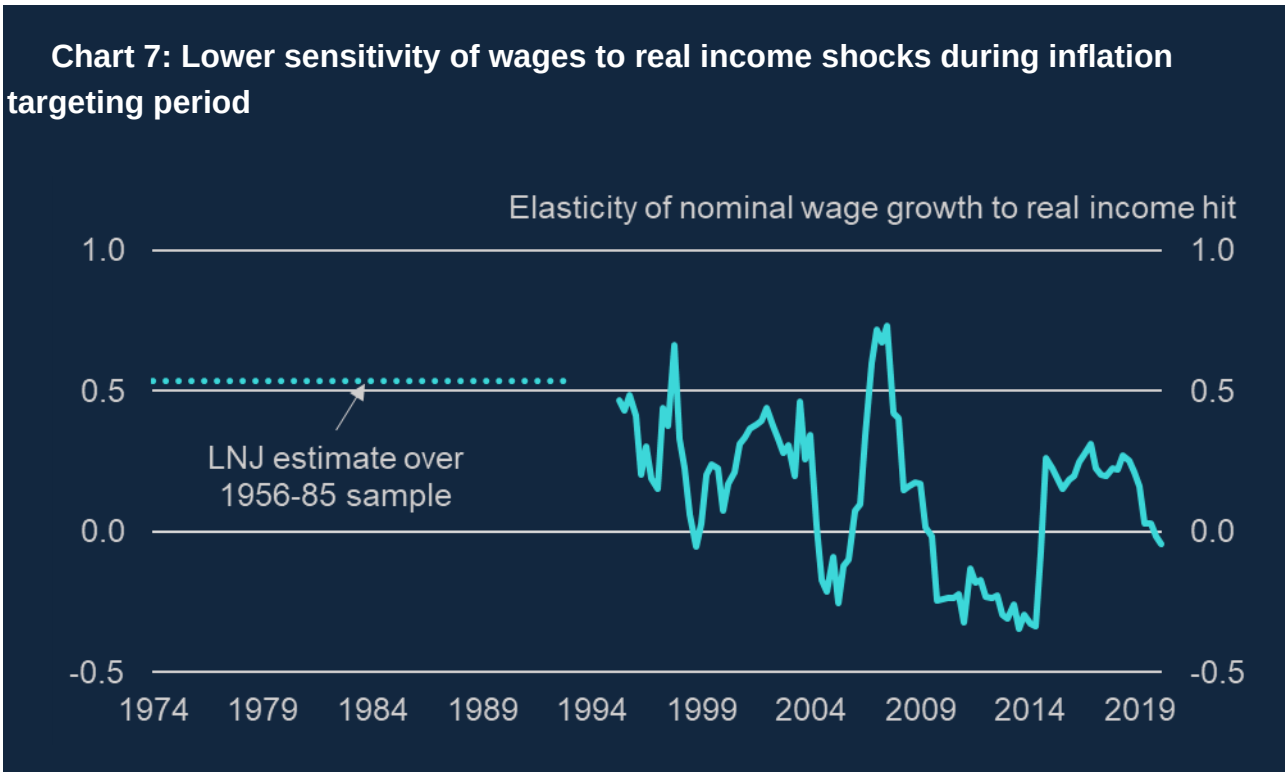
In gauging the potential strength of these "second-round effects", how much did we have to go on? Not much, is the answer. As we saw earlier, import (and therefore consumer) prices have risen much faster than those of output. It's this widening dislocation that has depressed real incomes. One way to measure the strength of "second-round effects" is to ask how changes in the "wedge" between output and consumer prices affect near-term nominal wage growth. Are external hits to real income absorbed relatively quiescently, without much of an effect on domestic inflation? Or is there sufficient resistance that people want to claw back in higher nominal pay what they've lost from higher import prices?

This was something that received quite a bit of attention from labour market economists during the 1980s and 1990s. It was clear then that external influences on real incomes – from changes in import prices or taxes – could have significant second-round effects. Using data from 1956-85, the economists Layard, Nickell and Jackman estimated that a 1% hit to real incomes pushed up near-term nominal wage growth by somewhere between

0.5 and 0.6 percentage points[5]. The rapid response of pay growth to the big hike in VAT in 1979 was one example.

Over time, however – and above all during the inflation targeting period – this sensitivity seemed to decline. Chart 7 plots rolling estimates of this coefficient over the past thirty years. According to these, nominal pay growth during the inflation targeting era has become increasingly desensitised to shifts in the wedge between consumer and output prices. There were periods when it might have responded. After the financial crisis, sterling fell, pushing up the cost of imports, and productivity growth declined. Yet there was almost no perceptible response of nominal pay and domestic prices. Economists attributed this decline either to the change in monetary regime itself, or – more often – to greater flexibility in the labour market.

**Chart 7: Lower sensitivity of wages to real income shocks during inflation targeting period**




Rolling coefficient on wedge between consumer and output prices using 18-year regressions. Dotted line shows coefficient estimated by Layard, Nickell and Jackman (LNJ) on 1956-85 sample. Source: Layard, Nickell and Jackman (1991), ONS and Bank calculations.

But it was hard to be confident about these estimates.

Labour-market flexibility isn't set in stone. In a speech in 2006[6], Charlie Bean suggested that increased ease of migration, in both directions, might have reduced the sensitivity of real wages to shifts in labour demand. It's possible that, by adding a degree of friction to

[5] Layard, Nickell & Jackman (1991), 'Unemployment: Macroeconomic Performance and the Labour Market'.
[6] Bean (2006), 'Globalisation and Inflation'.

the inflow and outflow of migrant workers, the combination of Brexit and the pandemic have made the labour market less adaptable than it was a few years ago.

There may be other reasons why susceptibility to second-round effects can vary. During the one period in which higher import prices seriously impinged on real incomes, following the financial crisis, unemployment was also much higher than it is today. Perhaps this deterred employees from seeking compensating rises in nominal pay (perhaps, in other words, the response to a given hit to real incomes depends on the degree of slack in the labour market and the wider economy).

Those post-crisis years aside, there simply wasn't much evidence on which to draw from the inflation-targeting era. That's why the estimates in Chart 7 are relatively unstable. The fact is that we've never really seen anything like the hits to real income the economy has had to endure over the past couple of years. And absence of evidence isn't evidence of absence.

This uncertainty about the potential scale of second-round effects has some bearing on how monetary authorities, including the MPC, have responded to this surge in inflation. There's long been a debate about how quickly policy should react to news about the economy. Should interest rates be adjusted immediately to a level that's likely to be appropriate for some time? If so, one wouldn't expect to have to make any further changes at the following few meetings (in the absence of any incoming news that alters the outlook). Or should they respond to inflationary news only by degrees, in which case there's a natural upward slope to the near-term path of interest rates? Even having tightened policy at one meeting, there would need to be negative news about the outlook *not* to do so again at the following one.

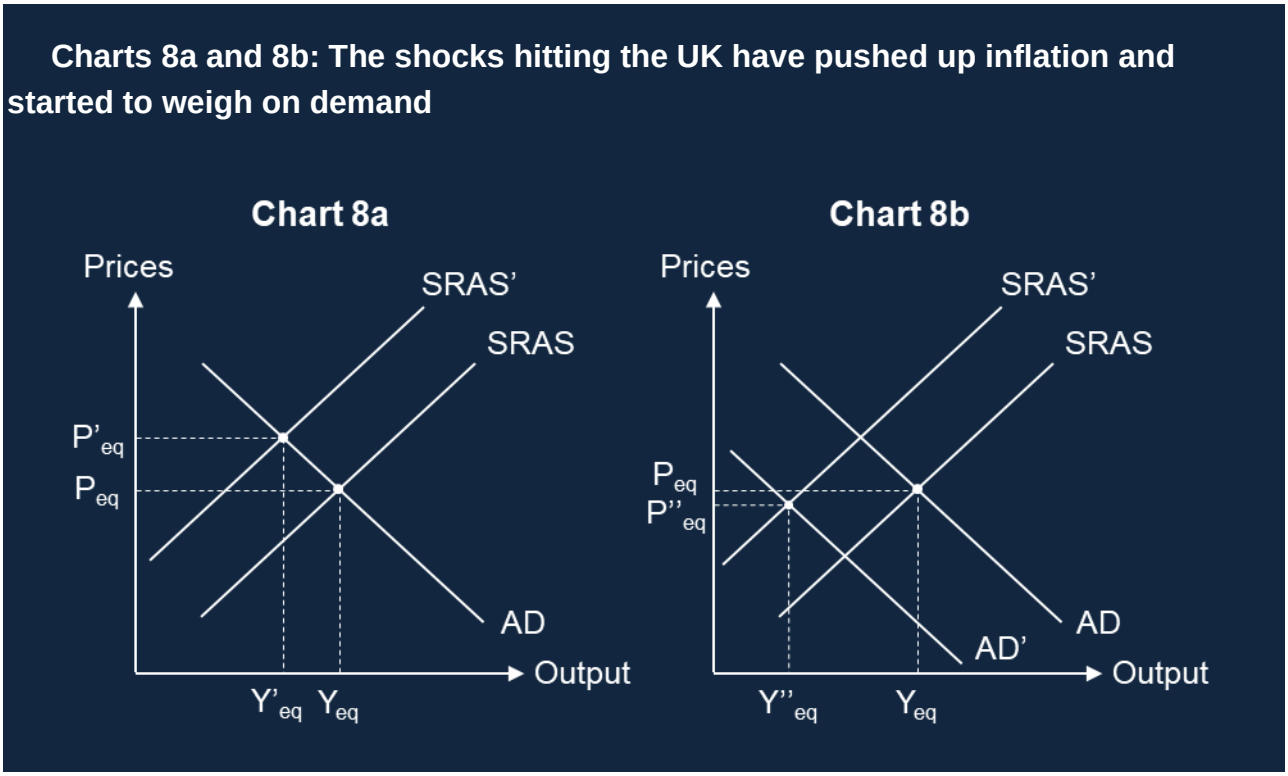
In the data, there does appear to be a degree of "smoothness" in the way official interest rates behave. Rather than jumping from one level to another, factoring in all the news at once, the policy rate usually seems to respond to it over time. Two explanations have often been suggested. One is uncertainty about the impact of changes in official interest rates. If there's a degree of imprecision in estimates of policy multipliers there's a case for moving a little more gingerly than otherwise. Another, offered by the economist Michael Woodford, is that smoothing the spot interest rate gives the central bank better control of medium-term interest rates, which may matter more in the transmission of policy.

In this case I think a third factor may be at play, namely the need to learn about the extent of these "second-round effects". We have inevitably had to learn about them and, therefore, to respond to signs of more persistent domestic inflation as and when they emerge.

## The response to demand shocks

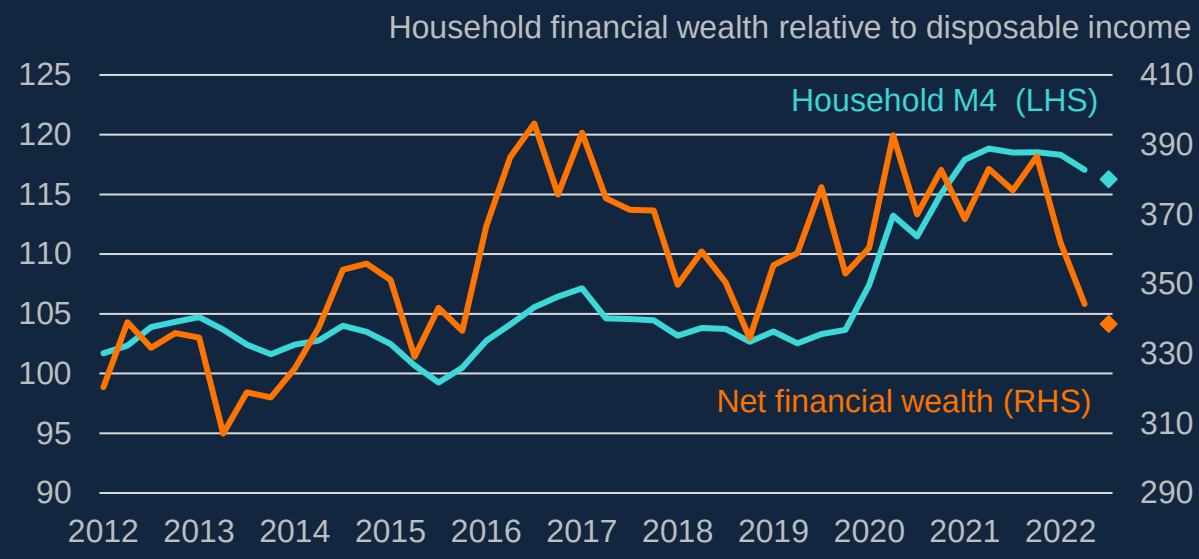
This is less the case when it comes to plain-vanilla shifts in aggregate demand. These are more common and the appropriate response is well understood: an inflation-targeting monetary authority has to lean against them. Indeed, one additional reason for caution, in the face of these big rises in import prices and their impact on domestic inflation, has been the likelihood that they will also weigh significantly on domestic demand. Employing again the simple AD/AS framework, their initial impact may have resembled a leftward shift in supply (Chart 8a) – but in time these hits to real income also take their toll on demand, shifting the AD line to the left as well (Chart 8b).

**Charts 8a and 8b: The shocks hitting the UK have pushed up inflation and started to weigh on demand**




That hasn't happened to any appreciable extent so far. Households emerged from the pandemic with extremely high rates of saving: having been so suppressed during the lockdowns, consumer spending had ample room to bounce back when they were lifted (even without any subsequent growth in income). Those high saving rates had resulted in the accumulation of significant "excess deposits": measured relative to household incomes, they were around 15% higher than before the pandemic (Chart 9). Wider measures of households' financial wealth had also recovered strongly, along with global equity markets, and those too were comfortably above average. All this provided the support for a very steep decline in the rate of saving (i.e. for consumption to grow much faster than income) once the economy came out of the lockdowns.

**Chart 9: "Excess deposits" have fallen only slightly but households' overall financial wealth is down sharply**




2022 Q3 data points are estimated. Sources: Bank of England, ONS and Bank calculations.

But to varying degrees these cushions have since been eroded. The saving rate has fallen sharply and is now around a percentage point below its long-term, pre-Covid average. Most of the excess deposits remain, it seems. But one might ask *why* they do – why, at a time of significant reported pressure on household finances (when consumer confidence has been setting new record lows), more of them haven't been spent – and therefore whether it's realistic to think that they will be in the near future. As many have pointed out, these deposits are probably skewed towards the upper end of the income distribution (and therefore away from those for whom rises in energy prices are the most burdensome). It's also worth recognising that other household assets have been weakening sharply this year. Despite higher deposits, households' overall net financial wealth is quite a bit lower than before the pandemic. It fell sharply during the first half of this year (relative to income) and is likely to have fallen further since then (the dot at the end of Chart 9 is an estimate of the position at the end of Q3, based on recent moves in asset prices).

All this suggests that, if household spending has been unusually independent of income since the pandemic, that is less likely to be the case from now on. The correlation with income is likely to be re-established. And it therefore mattered quite a lot, for the MPC's projections in August, that households were set to experience further steep rises in their energy bills. Given the path of wholesale gas prices implied by financial markets at the time, OFGEM's price cap was set to rise (in the central forecast) by over 3% of household income by next spring. Households' real disposable income was projected to decline by 2½%, with consumer spending down by over 1%. This reduced inflationary pressure in the medium term, helping to pull inflation below target towards the end of the three-year

forecast period. (I say “helping” because other things mattered too, not least the further rise in Bank Rate, to a peak of around 3%, then priced into financial markets.)

It therefore mattered too that the new government then launched its Energy Price Guarantee, forestalling the rise in energy bills. For as long as the scheme’s in place this will temper any further rise in headline inflation, and with it any related increase in “second-round” effects over the medium term. However, by relieving some of the immediate pressure on household finances, the policy would also add significantly to domestic spending over the next year (relative to our last forecast). At the margin, the task of reducing overall demand growth, in order to bring inflation back to target, would therefore tilt more towards monetary policy. And as I argued earlier, there’s less reason to respond to this news in a “gradual” or “smoothed” manner.

Whether or not that response needs to be as large as the shift in market interest rates, since our last set of forecasts, remains to be seen.

For one thing, there is now some uncertainty about the prospective scale and nature of the government’s energy subsidies. On Monday the Chancellor said the Energy Price Guarantee would be maintained only for six months, rather than the two-year period originally planned. He suggested support was likely to continue, beyond six months, albeit in a more targeted fashion. But we are unlikely to know for a while precisely the form that will take.

Second, the rise in market interest rates has been very dramatic. At the time of the Monetary Policy Report in August, prices in financial markets were consistent with Bank Rate rising to a peak of 3% next spring and then falling back a little over the following year. Despite a decline in recent days, that expected peak is now around 5¼%. This is by some distance the largest rise in market interest rates between MPC forecasts since the Committee was founded.

By way of comparison, Chart 10 plots this increase in market interest rates against one particular, simple representation of how interest rates might have had to respond to a couple of key developments since August: the decline in sterling’s exchange rate and the original, two-year version of the Energy Price Cap. Both would tend to raise medium-term inflation, for any given level of interest rates, and would therefore tend to merit an additional response from policy (all else equal). This is expressed in Chart 10 as the change in something called an “Optimal Policy Projection”, or “OPP”. From time to time, the Committee is shown these OPPs to inform its policy judgement. The **Annex** provides more background on the OPPs.

**Chart 10: Market interest rates have risen dramatically since the August MPR**

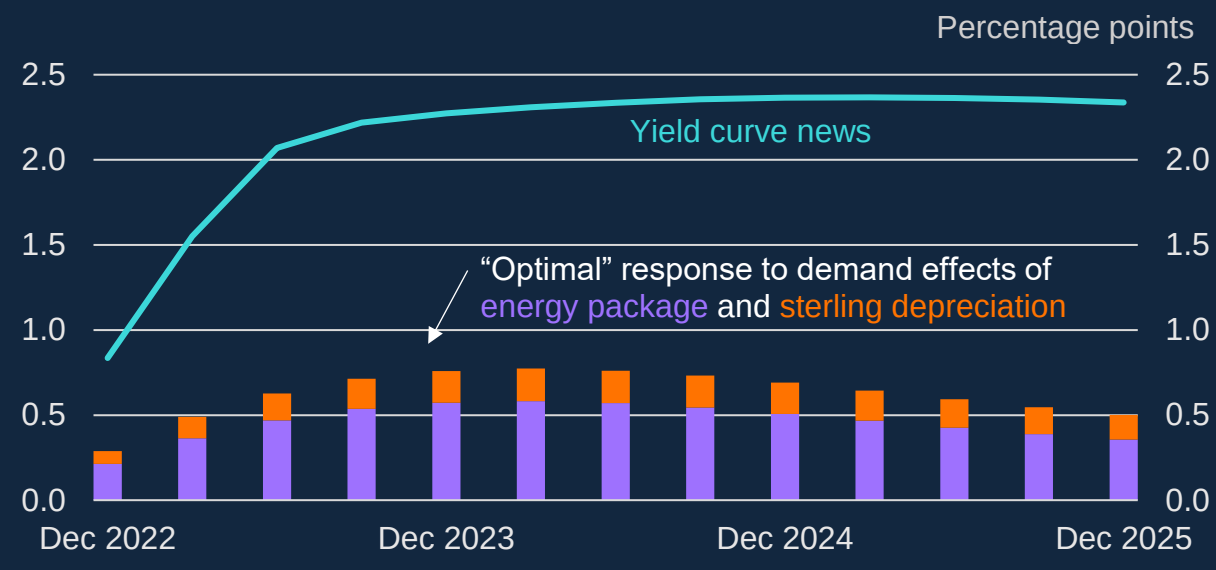



Chart shows the marginal impact on the OPPs of the original Energy Price guarantee, assuming that energy prices remain flat at a level consistent with the guarantee once it has expired. The exchange rate impact is calculated using a path for sterling ERI that is half way between its starting level at close on 17 October and a path implied by interest rate differentials. Both marginals are calculated relative to the August 2022 MPR forecast. The yield curve news is calculated using the path for Bank Rate implied by forward market interest rates at close on 17 October relative to the August 2022 MPR forecast. Source: Bank of England, ONS, Bloomberg Finance L.P. and Bank calculations.

One should always take the OPPs with a healthy dose of salt. They are based on a particular characterisation of the MPC's objectives. (We ask a simple policymaking "bot" to stabilise inflation and output, placing four times more weight on the first than the second, and to pay some heed too to the "smoothness" of interest rates). The resulting path obviously depends on the extent to which interest rates are assumed to affect demand and inflation. The higher the policy multipliers the smaller the "optimal" response of interest rates is likely to be. It's also conditional on – and therefore highly sensitive to – the particular forecast on which it's based. Any observer – indeed any individual MPC member – who sees the risks differently from those in the central projection will come to a different conclusion about the most likely path of future interest rates.

Furthermore, as regards the comparison in Chart 10, the Energy Price Cap and the currency have not been the only pieces of news since August that might have influenced market expectations. For example, forward interest rates rose a cumulative 50bp on the (nine) days on which UK price and wage data were released. The market may also be wary about further changes in fiscal policy, and to take a skewed view of the risks in that respect.

Nevertheless, the graph does serve to illustrate quite how significant the moves in markets have been in the past couple of months or so. If Bank Rate really were to reach 5¼%, given reasonable policy multipliers, the cumulative impact on GDP of the entire hiking cycle would be just under 5% - of which only around one quarter has already come through (Chart 11).

**Chart 11: Most of the impact of cumulative tightening implied by market prices yet to come**

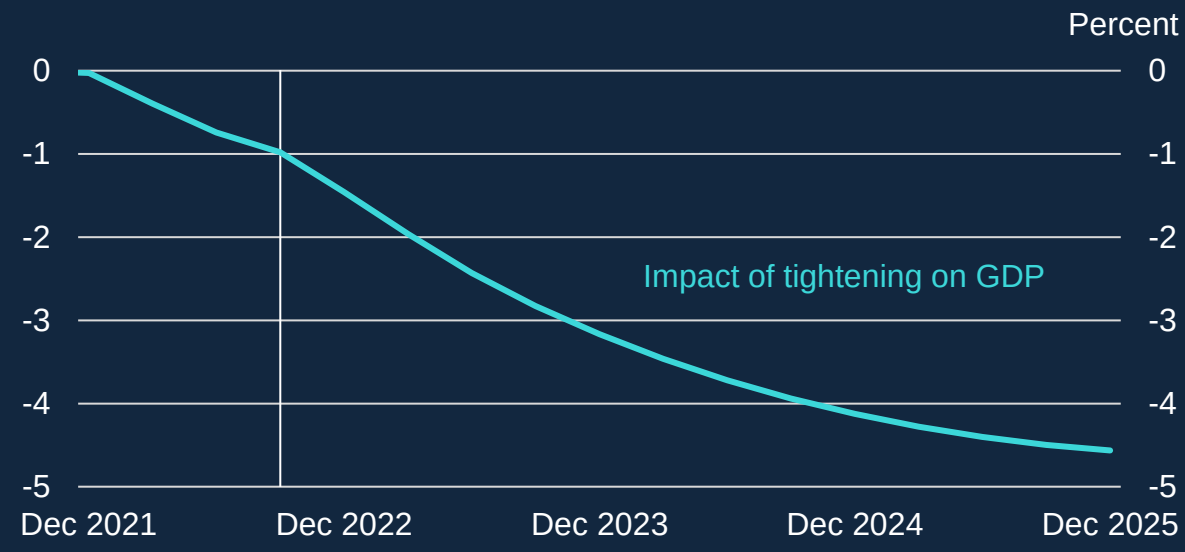


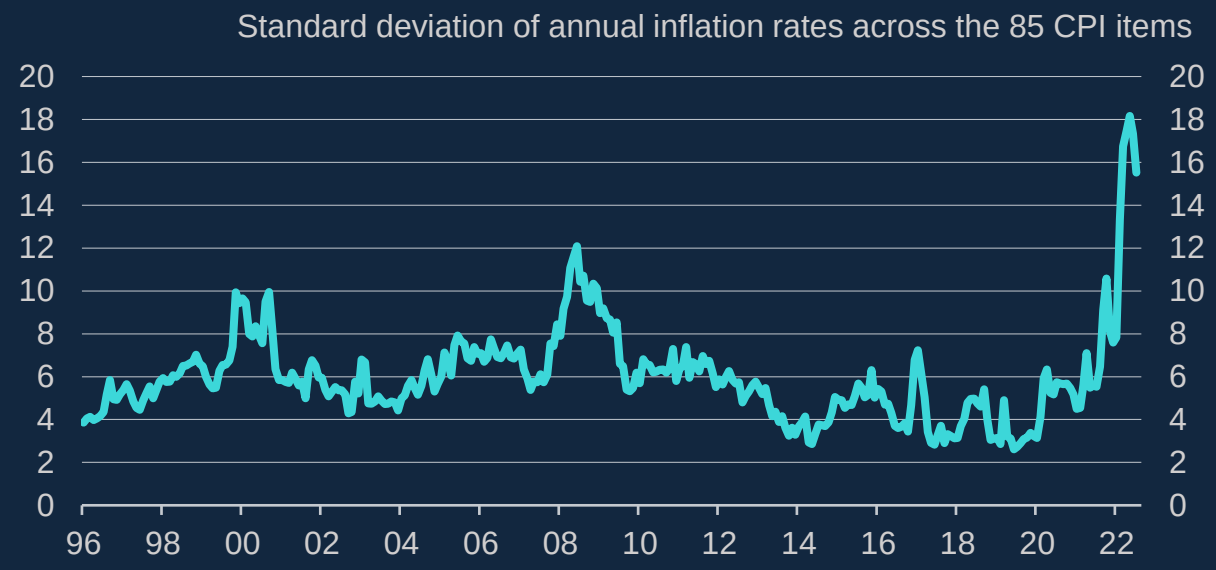

Chart shows estimated impact of policy tightening to date and as implied by forward market interest rates at close on 17 October, relative to a counterfactual in which Bank Rate is held constant at 0.1%. The exercise only considers the direct effects of tightening, and abstracts from any indirect effects via, for example, the exchange rate or incomplete pass-through. Source: Bank of England, ONS, Bloomberg Finance L.P. and Bank calculations.

## Summary and conclusion

One often hears that real incomes are lower “because of” inflation. In some ways the opposite is closer to the truth: (domestic) inflation is higher because of (external) hits to real incomes.

The economy has been hit by severe real shocks. The pandemic raised the global demand for goods and reduced their supply; Russia has cut back severely its supply of gas to Europe. These have had dramatic effects on relative prices (Chart 12 shows the dispersion of inflation rates across the components of the CPI). In particular, import prices have risen significantly compared with the price of UK output. This has unavoidably depressed real incomes: the volume of output may have just about recovered to pre-Covid levels but its consumption value has not.

**Chart 12: There have been big shifts in relative prices within the CPI**




Source: ONS and Bank calculations.

It's understandable that employees and firms should want compensation for these losses, by raising wages and domestic prices. Unfortunately, and at least collectively, these efforts will not make us better off. The effect is to raise domestic inflation with no ultimate impact on average real incomes.

The potential for these "second-round effects" was always uncertain. On the one hand, empirical estimates suggested that, since the 1970s and 80s, domestic inflation had become less susceptible to shifts in real income, perhaps because of improvements in labour-market flexibility. On the other hand, the economy hadn't experienced a hit to real income on this scale. As it is, monetary policy has had to respond to the rise in domestic inflation as and when it's become apparent in the data.

The justification for tighter policy is clear. It remains the case that most of the overshoot in headline CPI inflation, relative to target, reflects the direct impact of higher import prices. It also remains likely that much of this is likely to fade as those prices stabilise. This appears already to be happening in areas most affected by the pandemic. The path of wholesale energy prices is highly uncertain but here too rates of inflation – annual rates have averaged over 300% in the past six months[7] – are in time likely to fall significantly. Indeed financial markets suggest we're more likely to see negative than positive inflation in wholesale gas prices a couple of years from now. Domestic inflation tends to more

[7] This is the rate for (six-month) forward prices. These are more relevant than the spot price for retail pricing.

persistent, however. And reducing it requires the economy to grow below its trend rate for a period of time.

Because they've depressed real incomes, that slowing in demand will to some degree follow from the very same rises in import costs that have pushed up headline inflation. Equally, if government support mitigates that effect, there is more at the margin for monetary policy to do. The MPC is likely to respond relatively promptly to news about fiscal policy. Whether official interest rates have to rise by quite as much as currently priced in financial markets remains to be seen.

I've received helpful comments from colleagues at the Bank of England. I'd like to thank Fabrizio Cadamagnani, Kieran Dent, Joseph Oyegoke and Doug Rendle for their help in preparing the speech. The views expressed are my own and do not necessarily reflect those of the Bank of England or other members of the Monetary Policy Committee or the Financial Policy Committee.