BANK OF ENGLAND

Speech

Inflation and beliefs about inflation

Speech given by

Ben Broadbent, Deputy Governor Monetary Policy

London Business School

4 March 2020

I've received helpful comments from colleagues at the Bank of England. I'd particularly like to thank Mette Nielsen, Kate Reinold, Fergus Cumming and Ryland Thomas 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 Financial Policy Committee or the Monetary Policy Committee.

Hello!

My topic today is inflation. This shouldn't be too surprising, given our remit. The stability of inflation is the MPC's primary objective and it's the medium-term outlook for inflation that matters most for monetary policy.

This talk won't be about the current outlook. However, I thought I'd begin with some brief remarks about the potential impact of the coronavirus outbreak. This is, above all else, a matter of human health and welfare. In that respect we are fortunate in this country to have the infrastructure and expertise in public health that we do. As we've seen from the experience of other countries, however, the spread of the virus, and the measures to contain that spread, can also have a very significant impact on economic activity. Judging by past episodes it's likely that the impact will ultimately be temporary. As such, the outbreak should not directly affect the longer-term viability and productive potential of most businesses or of the economy as a whole. Precisely for that reason, there may therefore be a role for economic policy to support activity and the provision of credit in the meantime, in order to ensure that short-term disruption doesn't result in longer-term damage. We are in regular and close contact with government officials and with our peers in other central banks. As the Governor indicated in a statement yesterday the Bank's three policy committees – the MPC, FPC and PRC – met on Monday and discussed a range of macro-economic and financial scenarios. We will continue to monitor closely these fast-moving developments and to consider any policy response as appropriate.

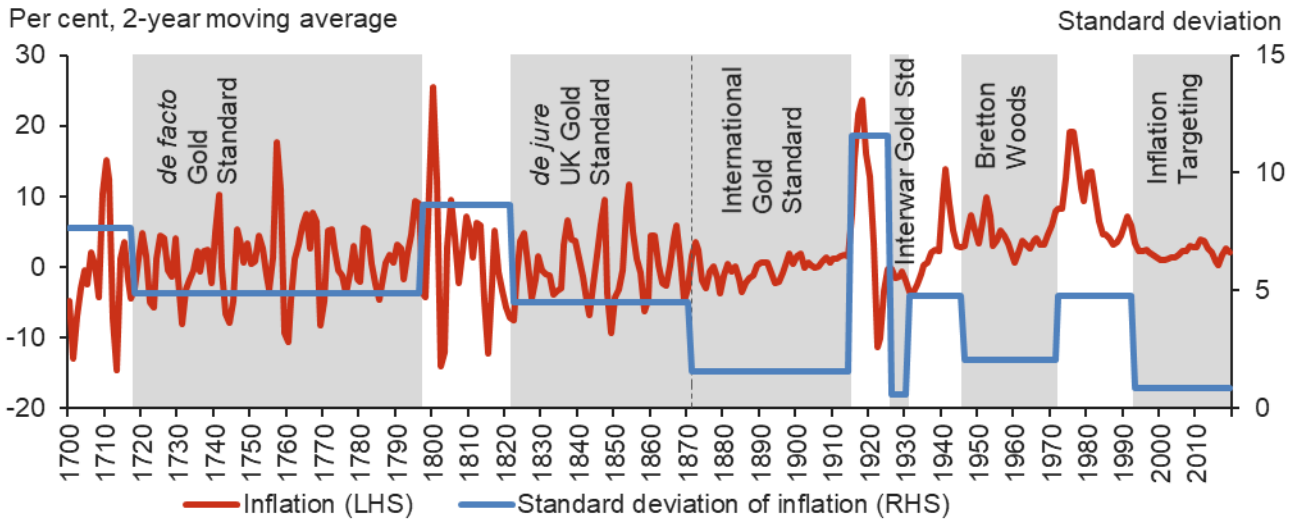
For the MPC what matters most in this respect will be the potential medium-term impact on inflation. As I've said, however, my focus today is more about the longer-term history and what that might teach us about how inflation is determined. More specifically, I want to discuss the risks of ignoring or underplaying the central role of monetary policy in that process.

If by "longer term" one meant only the last quarter century that history is exceptionally (and reassuringly) dull. Consumer price inflation has been even more stable in the past 25 years than it was during the period of the international gold standard (1871-1914). In fact, if you believe the estimates of consumer prices the Bank has compiled – a series that extends back to the early 13th century – this has been the most stable quarter-century for inflation in (at least) 800 years. Chart 1 plots the rate of inflation (in red), and its variability (in blue), over the more modern part of that history, from 1700[1].

This is a good thing. It's extremely difficult for businesses to make decisions, or for an economy to function near its full potential, if prices are volatile and unpredictable. That's why, after such a long period of highly

[1] The inflation series is averaged over two-year periods, to avoid exaggerating its volatility early in the sample, when there is more likely to be measurement error in the level of prices.

Chart 1: Inflation stable when monetary policy has a clear and stable objective, less so otherwise



Sources: Thomas and Dimsdale (2017) (based on Crafts and Mills (1994), Feinstein (1991), Feinstein (1998), Mitchell (1988), O'Donoghue et al (2004), ONS, and Bank calculations) and Bank calculations.

unstable inflation, extending as far back as the suspension of the gold standard at the outbreak of the First World War, the UK government finally settled in 1992 on a fixed inflation target[2].

Welcome though it has been, however, one side-effect of inflation's stability has been to obscure its underlying causes. Unable to conduct laboratory experiments, economists rely on their natural equivalents – testable variations in the real-world data – to uncover the underlying economic relationships. Even then it's not always straightforward to extract signal from noise or to separate cause from effect. It's just that much harder if you take those variations away. In particular, it's more difficult to contest two related claims that have been made quite often about inflation in recent years[3]. One is that its stability is mainly the result of some structural factor or other – examples I've seen include globalisation, de-unionisation and the internet – rather than the inflation targeting regime for monetary policy. Another is that, even if it ever had such a power, monetary policy has lost its ability to affect inflation.

This charge of monetary impotence comes in various forms. If the transmission of monetary policy occurs archetypically in stages – from the instrument of policy to asset prices and broader financial and credit conditions; from financial conditions to spending and demand; and then from the pressure of demand on supply to inflation – then all three have at various times been questioned. Perhaps, in a globalised financial system, a single country's monetary policy has little impact on its domestic financial conditions. Maybe demand is no longer sensitive to those financial conditions anyway – look at how weak economic growth has been in recent years, despite low interest rates. And even when economies have improved, not much has

[2] There has been one change in that period. In 2003 the target was altered from a rate of 2½% a year as measured by RPIX to 2% for CPI inflation. However, given the average spread between the two at the time the change had little impact (by design) on appropriate monetary policy or for medium-term inflation expectations.

[3] See, for example, FT (2017), Borio (2017), FT (2019a) and FT (2019b).

happened to prices, so maybe inflation is in any case insensitive to the pressure of demand on supply. The claim is that, if it's not altogether extinct, the so-called Phillips curve – the relationship between inflation and the degree of excess demand in the economy (sometimes called the "output gap") – has at least become a lot weaker[4].

I think this scepticism is overdone. More than that, I think the view that monetary policy is structurally unable to affect inflation carries quite a bit of risk with it. It can encourage inaction, in cases both when inflation is persistently low and also when it's too high. In today's talk I want to expand on this point.

In the case for the defence against the charge of monetary impotence exhibit A might well be the longer-term history in Chart 1. If monetary policy had no impact on inflation then nor would changes in the monetary regime. That's clearly not the case. During the centuries of experience we've had in this country the only two periods in which inflation has been reasonable stable overlap precisely those in which there's also been a stable goal for policy and an operationally independent authority to meet it. It would be a very striking (and, to my mind, implausible) coincidence if that were simply down to chance.

Beyond this, and in the body of the speech, I will make three broad points.

The first concerns the empirical relationship between inflation and the output gap. All I'll do here is to re-iterate a point that's been made by many others, including my fellow MPC member Silvana Tenreyro. When monetary policy successfully stabilises inflation you wouldn't necessarily expect to find much of a correlation with the output gap in the realised data, even when there's a robust causal link in the underlying economy. That's because policy will actively seek to counteract the very things – persistent shocks to demand – that would trace it out. In fact, to the extent inflation is also affected by things other than demand – things that policy will be inclined to offset – the measured correlation with the output gap could even be negative. The general lesson is to take care in making inferences from simple correlations. Unless you've estimated a truly "structural" relationship, one that's invariant to policy, the objectives and conduct of policy will in general affect your results.

The second point involves the low inflation "traps". This is one situation where monetary policy – a one-off policy action, at least – can lose its grip. Ever since Keynes, and his description of what happened in the Great Depression, economists have recognised that inflation might get stuck at very low levels. The two jaws of the trap are the lower bound for nominal interest rates and the risk that people come to expect low inflation to persist. If inflation expectations are sufficiently low then, even with nominal rates at their lower bound, real interest rates may be too high to sustain demand, keeping actual inflation below target. Closing from the other direction, persistently low inflation could, in its turn, confirm and encourage the subdued expectations.

[4] One often comes across more than one of these ideas in a single piece of economic commentary. Though descriptions of it vary, "Modern Monetary Theory" – a collection of claims connected with the financing of government deficits – seems to hold to all of them at once. In MMT (so-called) monetary policy is thrice damned.

Under these circumstances a one-off expansion of monetary policy can prove ineffective. If their yields are depressed right along the maturity spectrum government bonds start to look a lot like central bank money – they're both safe, low-yielding and liquid assets – and the act of exchanging one for the other (i.e. QE) won't necessarily do much to asset prices or demand. This presents an important caveat to the claim that monetary policy can always and easily control demand and inflation.

To be clear, I don't think the UK is at or close to such a situation currently. In recent years, even with interest rates somewhat above the lower bound, monetary policy has been sufficiently loose for demand to have outstripped supply (the rate of unemployment and the general level of spare capacity in the economy have declined). Nor have there been any signs of inflation expectations slipping the anchor of the inflation target.

More generally, it's important to understand that these traps are not intrinsically inescapable. In theory, the monetary authority could climb out of one if, in addition to easing policy today, it were able to make a credible commitment to "over" expansionary policy in the future: a believable promise to keep policy easy even in the event of something that would tend to push inflation up (and that would normally be met with higher interest rates). This is the caveat to the caveat.

In reality, of course, convincing people of this may not be a straightforward task, particularly if inflation has been persistently below target for a long time. But if the obstacle to it is a mistaken scepticism that monetary policy could ever do anything – that weak inflation is an unavoidable fact of life and that attempts to escape it are therefore pointless – then it becomes all the more important to challenge that view. This may be relevant for the current debates about monetary policy in the euro area.

The third point involves the same sorts of risks but this time in the face of high inflation. In the UK of the 1950s and 1960s, the Bretton Woods fixed-exchange rate system helped to keep a lid on price rises. It also meant domestic monetary policy had little room to respond to domestic developments[5], devoted as it was to maintaining sterling's external value.

At the same time the idea that it wouldn't really be of much help in stabilising inflation anyway, even were one free to use it for such a purpose, was actually pretty widespread. In fact, it's not too much of an exaggeration to say that the belief that monetary policy didn't really matter much for inflation – that interest rates did little to demand and (in particular) that demand did little to prices – was close to an accepted truth in the British economic establishment of the time. Somehow, Keynes's description of the particular circumstances of the Great Depression had come to be seen as immutable laws, things that prevailed under any and all economic circumstances.

[5] More precisely, policy had little room to respond to domestic developments except to the extent those were consistent with the fixed exchange rate. At least until the late 1950s, when they began to be relaxed, exchange controls will also have increased the room for manoeuvre.

As such, that establishment was not well prepared for the inflation that followed, after the demise of the Bretton Woods system during the late 1960s and early 1970s. Indeed I think it's likely that the very high inflation of that period was in part the result of these mistaken beliefs. It's certainly hard to imagine the problem would have been as severe or as protracted as it was had there been more confidence in (and understanding of) the means of controlling it.

(Mis)-estimating the Phillips curve

So let's start with the empirical relationship between price inflation and output (more specifically the difference between actual output and the economy's supply capacity, known as the "output gap"). This is sometimes called the "price Phillips curve" to distinguish it from the relationship between wages and unemployment that was actually the focus of Phillips's original work.

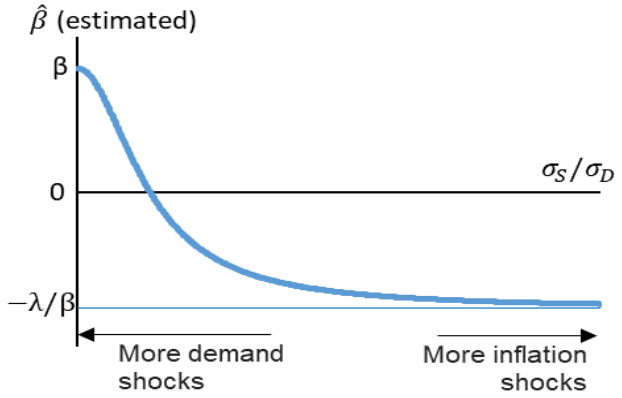
As Silvana has explained there are two essential points here. One is that, by acting to stabilise inflation, the monetary authority leans against the very things – persistent demand shocks – that would make it easy to see the Phillips curve in the actual economic data. The second – and related – point is that, if you look at measures of prices other than those targeted by central banks, you do often find a reliable relationship between pressures on real resources on the one hand and inflation on the other.

One way to illustrate the first point is to simulate an economy where, by construction, the Phillips curve works – increases in demand are inflationary – but in which there's also a monetary authority whose primary objective is to stabilise inflation. Realistically, we'll suppose that it takes a little time for policy to take effect. This means that the monetary authority won't be able to offset demand shocks in full. Any residual variations in the output gap would tend to induce a positive correlation with inflation in the actual data.

However, and also realistically, we'll allow too for the existence of things that move inflation around *independently* of demand, things that an inflation-targeting central bank will therefore be inclined to lean against. Because this involves moving demand in the opposite direction – developments that boost inflation will be met with contractionary monetary policy – shocks like this will tend to induce a negative correlation, in the realised data, between inflation and the output gap[6]. (An example of something that can affect inflation

[6] In symbols, we suppose the output gap y is set by policy up to some white-noise control error ε_D, with standard deviation σ_D. The policymaker acts under discretion to minimise the expected present value of $\pi^2+\lambda y^2$ where π is inflation and λ the weight placed on stabilising the output gap. The true slope of the Phillips curve is β and inflation also depends on the two disturbances s and ε_S: $\pi = \beta y + s + \varepsilon_S$. The distinction is that s is known when policy is set while ε_S (a forecast error) is not. There are no restrictions on s so it could include the common "New Keynesian" case in which inflation depends on a combination of lagged inflation and inflation expectations. In general it captures any pure inflation shock that matters at policy-relevant horizons. The standard deviation of s is σ_S. We're interested in the result of a regression of π on y and in particular the expected value of the regression coefficient.

Chart 2: When monetary policy targets inflation a simple regression will under-estimate the impact of demand

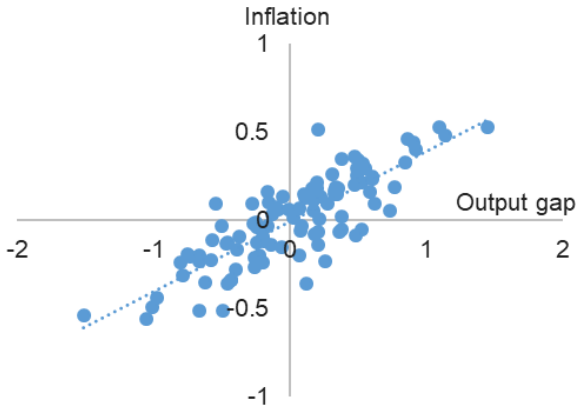


at policy-relevant horizons, other than the simple pressure of demand, might be the direct impact on CPI inflation of changes in sterling's exchange rate – so-called "pass-through").

What we're interested in is what you'd expect to find if, using the out-turns for inflation and the output gap generated by such an economy, you regressed one on the other. It turns out that, even in a relatively general setting, you can work out this number exactly (Chart 2).

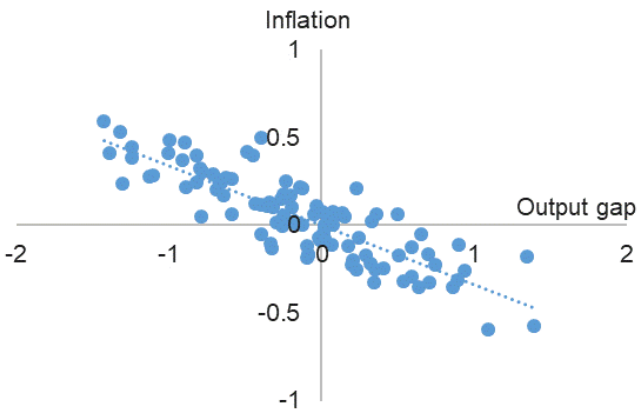
The answer depends on the extent of these pure ("trade-off-inducing") inflation shocks, relative to any residual variations in demand that monetary policy is unable to offset. When there aren't any such things – if the only thing that matters for inflation at policy-relevant horizons is the output gap – then the regression will provide an unbiased estimate of the true slope of the Phillips curve (β in the graph). But in general, during an inflation targeting regime, the estimate will be biased downwards[7]. And the more important these "trade-off-inducing" shocks, relative to any residual movements in demand – in Chart 2, the further you move to the right – the greater the extent of that bias. To make this a little more real Charts 3a and 3b generate data from such a model – the first when demand shocks predominate, the second where pure inflation shocks are more important – and you can see how the simple, "reduced-form" relationship between output and inflation shifts.

Chart 3a: When demand shocks predominate correlation between inflation and output gap will at least be positive…



Simulation of inflation and output gaps assuming $\sigma_S = 0.1$ and σ_D=0.5.

Chart 3b: … but the correlation can turn negative when inflation shocks are more prevalent



Simulation of inflation and output gaps assuming $\sigma_S = 0.5$ and σ_D=0.1.

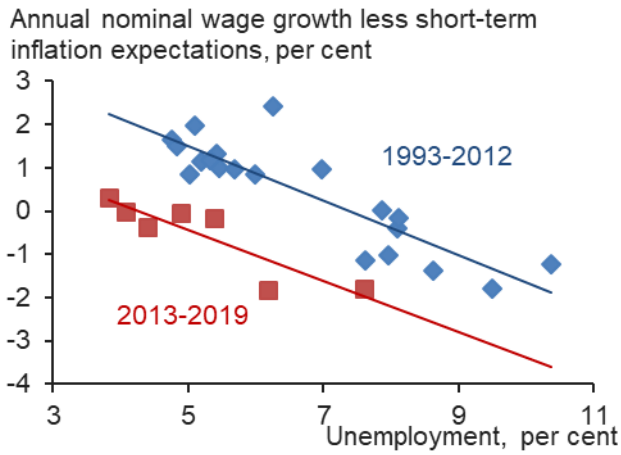
[7] Econometrically, the regression of π on y alone suffers from a simple "missing variable" problem – in this case the "s" term(s). In general this biases the remaining regression coefficients towards zero. The problem here is worse because, in an inflation-targeting regime, policy will actively lean against anything that affects inflation at policy-relevant horizons and in particular variations in s. This will introduce a source of negative correlation between y and π. The extent of the bias depends on the importance of these s disturbances relative to any residual variation in demand, σ_S/σ_D.

It's important to understand that this result depends on what monetary policy is being asked to do (in this case to target inflation). If the policy regime changes the downward bias may no longer hold. For example, if inflation expectations are very volatile – perhaps because people come to understand that the monetary authority doesn't care much about inflation – then the empirical Phillips curve will appear to steepen[8]. That's just because inflation would move up and down a great deal, un-tempered by policy and independently of the output gap. The more general point is that, unless you're estimating a truly structural relationship – something that's invariant to policy – your results will depend on what policy is doing.

This is, of course, a negative sort of point: it says only that you cannot, on the basis of the bare correlations alone, refute the existence of a Phillips curve for price inflation. It doesn't positively prove there is one. But there is such evidence – evidence more broadly that pressure on real resources produces nominal inflation – if you look away from the particular rates of inflation central banks have been asked to target.

Take the labour market in the UK. Chart 4 plots the relationship between unemployment and wage growth. It's clear this "wage Phillips curve" has shifted down in the past few years, in response to lower productivity growth since the crisis. But there's no evidence the slope has declined: it was negative in the twenty years until 2012 and it's been equally so since. In fact, not only are the slopes of the two lines in Chart 4 very close to each other, they're also pretty much identical to what you get from Phillips's data, which run from 1861-1913, in his original 1958 paper[9] (Chart 5).

Chart 4: UK Phillips curve: down but not out



Sources: ONS, Bank of England, and Bank calculations.

Chart 5: Relationship between unemployment and wages similar to that during Gold Standard (1861-1913)

Sources: Thomas and Dimsdale (2017) (based on Boyer and Hatton (2002), Crafts and Mills (1994) and Bank calculations), and Bank calculations.

[8] The fact that the empirical Phillips curve will depend on the behaviour of inflation expectations was the central point made by Milton Friedman in his famous presidential address to the American Economic Association, over 50 years ago (Friedman (1968)).

[9] There is no clear relationship between UK unemployment and wage growth, at least in the simple reduced form data, after 1914 and until the introduction of inflation targeting in 1992 (see, for example, Chart 11 below). The fact that the relationship emerges only when there's a stable monetary regime, in which inflation expectations are relatively stable, would seem to bear out very well Friedman's point.

Similarly, Silvana and her co-author Michael McLeay illustrate that the estimated slope of the Phillips curve is steeper in regional US data than at the level of the whole economy (Charts 6a and 6b contrast the two). Jan Vlieghe (2018) made a similar point with sectoral wage data in the UK. Levy (2019) investigates the relationship between unemployment and wage growth in the euro area, again using regional data, and again finds a significant underlying relationship.

Chart 6a: Phillips curve at the level of the whole economy relatively flat

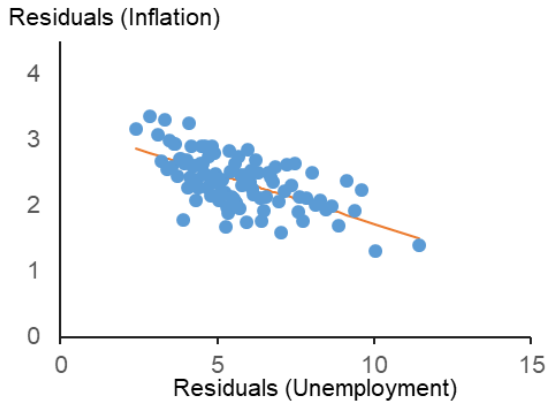
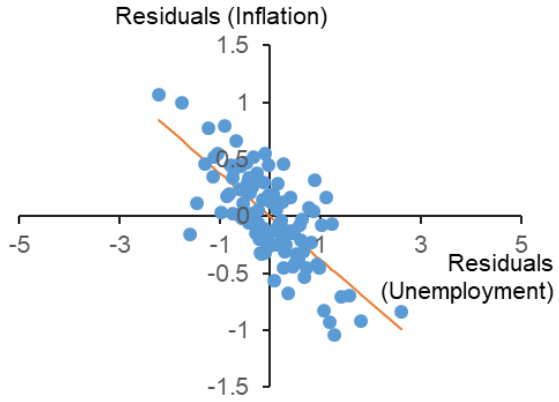


Chart 6b: The curve is steeper at a regional level



Charts reproduced from McLeay and Tenreyro, forthcoming in NBER Macroeconomics Annual 2019, Volume 34, edited by Martin Eichenbaum, Erik Hurst, and Jonathan Parker, from the University of Chicago Press. Chart 6a illustrates the pooled OLS regression, Chart 6b a regression with year and metro area fixed effects. Data in the charts have been averaged across 100 equal sized bins according to the unemployment rate.

Low inflation traps and "low for long" guidance

Let me now turn to the potential problem of persistently low inflation and the potential, in particular, for low inflation "traps". We know from both experience and theory that, in these circumstances, policy can lose its grip.

Our understanding of them has its origins in Keynes's description of the Great Depression, in his "General Theory" of 1936. The problem, according to Keynes, was not simply that there was a floor (at or near zero) for short-term nominal interest rates. It was that longer-term rates might become similarly constrained, in which case even QE, a policy that Keynes had strongly advocated in the early stages of the Great Depression, might lose its power to influence financial conditions and ultimately spending.

The description of this "liquidity trap"[10] in the General Theory wasn't a very precise one. A much more theoretically coherent version was set out by the economist Paul Krugman in 1998. What creates the "trap", in Krugman's framework, is that low realised rates of inflation start to depress people's expectations of future inflation. With nominal interest rates already constrained, and unable to fall any further, this raises real

[10] The term "liquidity trap" wasn't Keynes's term – it was actually coined in 1940 by the economist Denis Robertson. It was then adopted and promoted by the great economist John Hicks, who in 1937 had come up with the IS-LM framework as a simple, rigorous representation of Keynes's thinking.

interest rates and weakens demand. Weak demand, in its turn, keeps inflation low, confirming the initial pessimism of depressed inflation expectations.

In this environment even QE can lose its power. If nominal yields are depressed right along the maturity spectrum investors start to view government bonds and central bank money as very similar assets. As such, exchanging one for the other (which is what QE involves) has little direct effect. If I buy from the private sector something that's come to be seen as perpetually low-yielding, safe, and liquid, and pay for it with another low-yielding, safe, liquid asset (central bank money), it's not really going to do that much. Whether they involve yield, risk or liquidity, QE depends for its effects on the differences between pure money (central bank reserves) and government debt[11].

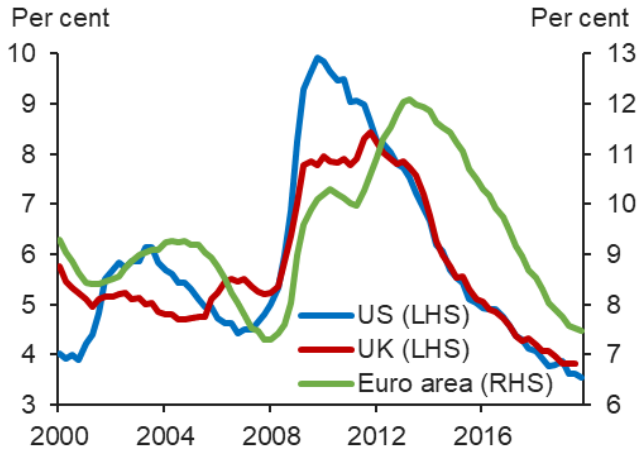
Krugman's interest in this issue went beyond the academic. He was writing at a time when Japan had just started to experience deflation and when its official interest rates were close to zero. Since then, it seems clear the "neutral" rate of interest – the level of real policy rates required to keep activity and inflation on an even keel – has declined significantly, across the world. This means that, even if inflation expectations stay anchored to the target, there's a higher chance that actual policy rates might become constrained at the nominal lower bound, priming one of the jaws of the trap.

Just to be clear, I don't think there's any evidence that the UK economy is in or even near such a trap. Demand growth has been enough to depress the rate of unemployment over a period of several years now. We can conclude that policy has clearly been supportive enough, even with interest rates above the lower bound, to ensure that demand has outstripped supply (Chart 7). And although inflation has at times fallen below target, there's no sign of any overall bias in recent years, nor any indication that inflation expectations have drifted downwards. Financial market measures are very close to their historical averages (Chart 8).

But the more general and important point is that that even when caught in this "trap" monetary policy is not wholly powerless. The key would be to break the link between low actual inflation and subdued expectations of future inflation. If the monetary authority can convince people that it will accommodate any positive inflationary shocks in future – and if there's any chance of them at all such shocks are bound to crop up at some point – this can help raise inflation expectations even when actual inflation is below target. As Krugman puts it: "If investors believe that the central bank will keep the pedal to the metal even as the economy begins to recover, this will imply higher inflation than if it hikes rates at the first hint of good news…

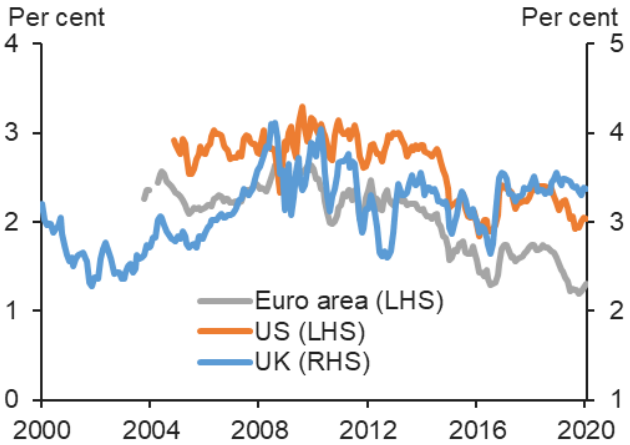
[11] Wallace (1981) had already made the more general point that, if there was no liquidity advantage to holding money, QE would in general be ineffective. The argument was similar to the Modigliani-Miller result for corporate balance sheets. In general, when short-term interest rates were above zero, this liquidity advantage clearly existed (who would otherwise hold something that was clearly inferior to other short-term assets in terms of its yield). As such, the neutrality result doesn't apply in normal times. When short-term interest rates are zero, however, this "Wallace neutrality" of QE is re-introduced (e.g. Eggertsson and Woodford (2003)).

Chart 7: Unemployment has been falling: policy has been supportive enough for demand to outstrip supply



Sources: ONS, Eikon by Refinitiv, and Bank calculations.

Chart 8: UK inflation compensation close to its historical average



UK rates are derived from index-linked gilts. US and Euro area rates are based on inflation swaps.
Sources: Bloomberg Finance L.P, Tradeweb and Bank calculations.

higher expected inflation means a lower real interest rate, and therefore a stronger economy... the central bank can still get traction if it can change expectations about future policy"[12].

This may not be an easy thing to do. After all, you might be trying to convince people that, even once the deflationary threat has passed, and in the event of a development to which the normal response would be to tighten policy, the monetary authority of the future – perhaps quite some time into the future – will instead sit on its hands.

It's possible that some sort of public commitment – a promise to keep policy easy until inflation reaches or even overshoots the target for a while – would help. This is the point of "low-for-long" forward guidance, a pledge by the central bank to keep policy rates at very low levels for a protracted period[13]. More recently, some economists – including former Fed Chair Ben Bernanke – have suggested that, if inflation has fallen below target for a while, the monetary authority should explicitly attempt to make up for that by overshooting for a period in future[14].

What would not help, in situations where this trap is a risk, is to signal that policy will react aggressively to the first signs of inflationary life. Positively unhelpful, it seems to me, is the suggestion that the right response to persistently undershooting the target is simply to lower that target. Moving the goalposts in this

[12] Krugman (2013).

[13] Reifschneider and Williams (2000). It's interesting that Keynes had recommended something similar in the early phase of the Great Depression. In order to depress the longer-term interest rate, which he saw as an important determinant of investment spending, he argued in 1930 that "it might be sufficient merely to produce a general belief in the long continuance of a very low rate of short-term interest". He also recognised the importance of a public commitment to that strategy: "A monetary policy which strikes public opinion as being experimental in character or easily liable to change may fail in its objective" (Keynes (1936)).

[14] Bernanke (2020); see also the recent speech by Fed Governor Lael Brainard (Brainard (2020)).

way will do little to stabilise inflation expectations, except perhaps at levels that provide even less space for monetary policy to react to negative shocks.

The inflation of the 1970s

The potential for the low-inflation trap exists because of the interaction between the lower bound for policy rates and the risk that inflation expectations become dislodged from the target rate.

There's no equivalent high-inflation trap because there's no equivalent upper bound for interest rates. But there's little doubt that, if people become used to high inflation, and expect it to continue, reversing course can become a more arduous and painful task. To see this, and if you'll forgive the use of symbols, it's helpful to write down the basic structure of the Phillips curve that most economists tend to use these days:

Inflation = a x *inflation expectations* + b x *lagged inflation* + *β* x *the output gap + other, "cost-push" shocks*

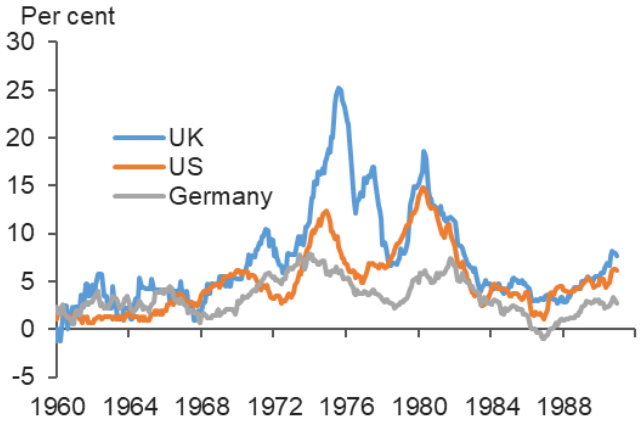
where a, b and β are fixed numbers[15]. What this implies, amongst other things, is that you have to work harder to get inflation down – you need a more negative output gap – if inflation expectations are themselves unresponsive to tighter policy. And after over a decade of extremely high and volatile inflation, this is the situation in which the UK authorities found themselves in the late 1970s.

In the mid-1960s, when the UK was still subject to the constraints of the Bretton Woods fixed-exchange rate system, inflation had been relatively well contained. But when that system then began to break down, and when it was subsequently given an additional boost by higher oil prices, inflation rose very sharply. That was true everywhere in the developed world, but the problem was significantly more severe in the UK than elsewhere (Chart 9). During the 1970s, consumer prices in the UK went up by 13% a year, on average, compared with 7% in the US and 5% in Germany. And although policy rates were clearly higher than in the 1960s, they remained below the rate of inflation for much of the time. As such, real policy rates were negative, and below those in the US and Europe, for most of the decade (Chart 10).

A natural question is why it took so long to address the problem. Although there might have been many contributory factors – the big jumps in oil prices in the first half of the decade were decidedly unhelpful – I think an important part of the story was the mistaken belief, at the outset, that monetary policy didn't really have a material part to play in either explaining or controlling inflation.

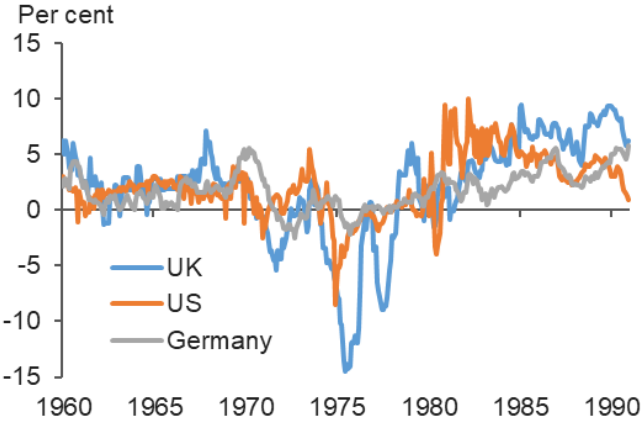
[15] These coefficients aren't arbitrary. In particular, theory dictates that a + b =1, ensuring that there is no long-run trade-off between output and inflation.

Chart 9: Inflation rose sharply in the UK in the 1970s



Sources: National sources, BIS Consumer price series (http://www.bis.org/statistics/cp.htm), and Bank calculations.

Chart 10: (Ex post) real policy rates were deeply negative



Note: Effective policy rate for Germany approximated by the mid-point of the discount rate and the Lombard rate for 1960-85.
Sources: National Sources, BIS policy rate statistics, BIS Consumer price series (http://www.bis.org/statistics/cp.htm.), Deutsche Bundesbank, and Bank calculations.

It was thought by many to be imperfect (at best) as a demand management tool. The Radcliffe Committee[16] – a body set up in the late 1950s by the then Chancellor to investigate the workings of the UK monetary and financial system – was certainly unconvinced:

"*When all has been said on the possibility of monetary action and of its likely efficacy, our conclusion is that monetary measures cannot alone be relied upon to keep in nice balance an economy subject to major strains from both without and within…..There can be no reliance on [the official interest rate] as a major short-term stabiliser of demand*".

And there was widespread scepticism, throughout the post-war period, that demand mattered for inflation anyway. If there was any sort of Phillips curve relationship at all, it was often seen as "L-shaped" – flat until some notional level of full capacity, usually believed to be some way away, had been reached.

Consider, for example, the opinion of the economist Nicholas Kaldor, adviser to the Treasury in the mid-1960s and again in the mid-1970s[17]:

There is a *"belief, for which there is no empirical support in the post-war statistics for this country, that there is a so-called "trade-off" between the level of unemployment and the rate of wage increases. Since the size*

[16] The "Committee on the Working of the Monetary System", chaired by the lawyer Cyril (Lord) Radcliffe, was set up by the Chancellor of the Exchequer in 1957 and published its findings (the "Radcliffe Report") in 1959. The report concluded that changes in the supply of money had little impact on interest rates and bond yields and that these, in their turn, did little to demand. In the parlance of Hicks's IS-LM model, the Radcliffe Report claimed that the LM curve was relatively flat and the IS curve relatively steep. See, for example, Aikman et al. (2018). In his famous presidential address to the American Economic Association, Friedman (1968) discusses similar views in the United States.

[17] I am indebted for all these quotes to Nelson (2001).

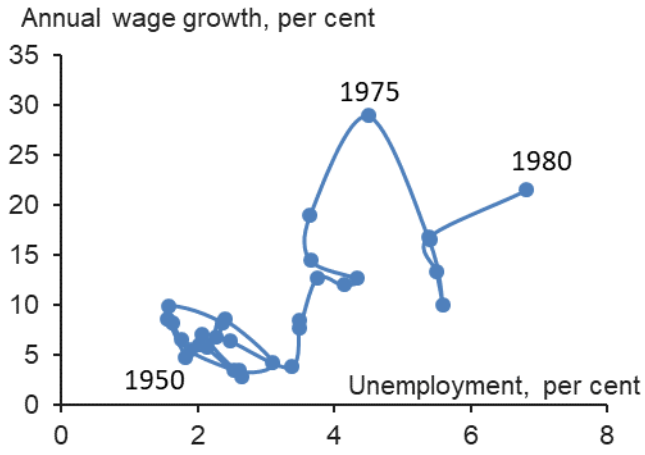
of wage settlements is determined in key sectors – and those are the sectors where jobs are secure [– then] even with large-scale unemployment… there is little reason why such a trade-off should exist".

Kaldor said this in 1977. But the view was widespread and had been held in many parts of the economic establishment for some time. In his submission to the Radcliffe Committee in 1957, Robert Neild – also an adviser to the Chancellor in the mid-1960s – claimed that:

"*The problem of persistent increases in costs and prices… is a problem inherent in the way [these things] are determined, and is likely to persist whether or not the level of demand is excessive*".

Perhaps it was (to a degree) forgivable to underplay the importance of monetary policy at that time because, until it began to break down in the late 1960s, the UK was bound by the fixed exchange rates of the Bretton Woods system. So except to the extent that capital controls created the room for it, there was no discretion for interest rates to move much away from international levels. And episodes of excess demand were more likely to create problems in the current account – these occurred frequently – than inflation.

Chart 11: No simple wage Phillips curve relationship through much of the post-war period



Sources: Thomas and Dimsdale (2017) (based on ONS, Feinstein (1972), and Bank calculations), and Bank calculations.

Furthermore, Kaldor was at least half right about one thing: through much of the post-war period, at least until inflation targeting began in 1992, it was difficult to detect in simple correlations the relationship between unemployment and wage growth (Chart 11). Very possibly this reflects a similar sort of problem that Silvana Tenreyro has discussed and that I sought to re-emphasise earlier: if you fail to take account of variations in other things that affect wage inflation (expectations of future inflation, for example), you will tend to under-estimate the importance of excess demand, unemployment in particular[18]. In the more stable environment of inflation targeting, and with pretty much the same slope as had existed during the second half of the 19th century, that underlying wage Phillips curve has re-emerged.

[18] As indicated above, in an earlier footnote (8), this was exactly the claim – amongst others – that Friedman made in his famous presidential address to the American Economic Association in 1968 (Friedman (1968)): the relationship between unemployment and wage inflation would only be apparent in simple correlations as long as other influences on wage growth – above all inflation expectations – were either constant or controlled for separately by the econometrician. If not, and if those expectations responded to actual inflation, the empirical Phillips curve would begin to turn vertical. This result may seem to contrast with Silvana's point that, under inflation targeting, the simple correlation between output and inflation is too low. But that only illustrates the general point that, if you mis-specify the relationship, and in particular you forget that the policy regime matters, the empirical results will be misleading. If policy is acting to stabilise inflation expectations and other (non-demand) influences, a simple regression will under-estimate the true slope of the Phillips curve. When expectations are volatile, and allowed to respond to inflationary shocks, the Phillips curve will look more vertical.

Anyhow, as Neild's remarks exemplify, excessive inflation – to the extent it occurred – was seen as inherently unrelated to demand, and this view persisted even once the Bretton Woods system formally ended in 1971. Kenneth Berrill, Chief Economic Adviser to the Treasury in 1973 and 1974, was clear at the time about the notion of an "L-shaped" Phillips curve:

"*I would say that we do not believe the Phillips curve over quite a large band…starting at the top end [from already low levels of unemployment], when you reduce unemployment [further], you can begin to see shortages of skilled labour, bottlenecks and so on… which affect the balance of payments and also earnings and prices. Then [at higher levels of unemployment] there is a large flat band*".

These views may not have been sufficient, on their own, to explain what happened in the 1970s. There were clearly other events (looser policy in the US in the late 1960s, higher oil prices in the 1970s) that helped to ignite the inflation. There may well have been structural features of the economy at the time (centralised and indexed wage bargaining, for example) that helped to propagate it. But it is hard to imagine that the outcome would have been as severe without the prevailing scepticism about the role of monetary policy. Not least, it would have given little confidence to those forming expectations of future inflation – themselves an important part of the inflation process – that the authorities would ever be inclined to offset it.

In a series of papers, the economist Tom Sargent asked how you might have expected inflation in the United States to have behaved, over the 1970s and 1980s, had you thrown the same initiating inflationary shocks at an imaginary economy in which there's a "true" Phillips curve that resembles the one we use today but where the monetary policymaker erroneously believes in something else.[19]

The particular misconception he had in mind was the idea that inflation expectations don't matter for inflation (in the language of the simple representation earlier in this section, the central bank wrongly believes that the coefficient a is zero). And as and when it sees this model going off track – as it almost surely will – the central bank diagnoses the problem as a change in the slope of the Phillips curve (β), rather than a more fundamental mis-specification, and updates its estimates of β accordingly. What it fails to do is to realise it's got the wrong model to begin with.

You can see how this might introduce long-term cycles into the behaviour of inflation. Suppose the central bank starts with the belief that excess demand doesn't do much to inflation (i.e. a low estimate of β) and therefore thinks it can boost output at relatively low inflationary cost. However, when it then eases policy, and because expectations of future inflation also start to rise in response, inflation itself goes up by more than the central bank had anticipated. Rather than realising why this has happened the central bank concludes that the Phillips curve is steeper than it had thought and that the inflationary cost of easy monetary policy is therefore higher than it had believed. Policy is re-tightened, inflation is brought back down and inflation expectations re-stabilise. Again, however, it fails to understand why this has happened. After a

[19] See Sargent et al (2006).

time, the stability of inflation expectations leads the authorities to believe the Phillips curve has flattened, and the cycle begins all over again. Sargent and his co-authors maintain that a simple model of this sort mimics closely the actual behaviour of US inflation over the past few decades.

Arguably, and whether fair or not as a description of the core belief of the Fed of the 1960s and 70s, the mis-conception Sargent investigates is a less egregious error than that of its counterparts in the UK. Certainly the remarks I've quoted seem to suggest a prior belief not only that a =0 but that β=0 as well – that neither inflation expectations nor the output gap matters. If so, I think this could help explain why the UK inflation of the 1970s was that much worse than elsewhere, including in the US.

Conclusion

In 2013 the economists Christina and David Romer wrote a short paper marking the century of the founding of the Federal Reserve. The title leaves the reader in little doubt about what the authors think. The paper's called "The Most Dangerous Idea in Federal Reserve History: Monetary Policy Doesn't Matter".

As they point out, there have clearly been occasions when mistakes have been made for the opposite reason. When monetary policy is overburdened, and asked to do things it ultimately cannot achieve – to keep unemployment permanently below its natural rate, for example, or indeed to control any real variable for extended periods of time – it risks losing control of the things it can (nominal variables like inflation).

But the authors maintain that the larger failures have resulted from a mistaken belief that monetary policy is powerless. The most egregious and well-documented case is the Great Depression. Even in the face of wholesale economic collapse – in the three years after the Wall Street crash, banks' balance sheets, output and even the level of consumer prices all fell by around a quarter – monetary policy was essentially inactive. Little was done because "many Federal Reserve officials believed that expansionary policy would not be effective and that it might involve substantial costs"[20].

We are, of course, a world away from the 1930s. Output has been growing pretty much without interruption for the past six years, across the developed world, and unemployment has fallen throughout. Nevertheless, there are echoes of that same scepticism about monetary policy in the face of the stubbornly low rates of inflation that exist in some areas.

There are circumstances in which, because of the interaction of the lower bound for policy rates and the behaviour of inflation expectations, one-off monetary policy actions can lose their grip. With the underlying, "equilibrium" real rate of interest still at very low levels, compressing policy rates at or close to that lower

[20] Sometimes the case for ineffectiveness amounted to no more than the observation that the contraction was continuing even though interest rates were already low. One opponent argued against what he saw as "the fruitlessness and unwisdom of attempting to depress still further the abnormally low interest rates now prevailing". As for the perceived costs, these often involved fears that easier policy would re-ignite the credit boom that had preceded the crash: "Cheap money is a stimulant", said one Fed Governor in an FOMC meeting in 1930, "but […it] encourages over-borrowing".

bound, and because low inflation has persisted for a while in some places, it is right to take the risks of such a trap seriously.

Equally, it's important to understand these things for what they are. It's not Amazon, global trade or de-unionisation that create the potential for low-inflation traps. Nor have these things permanently robbed monetary policy of its power. The direct correlation between the output gap and inflation has been low through the inflation targeting period, but in itself that tells you nothing about the underlying causal relationship.

If the view that inflation is determined by structural factors can lead you to policy errors when inflation is too low, we also know from direct experience that the same risk exists when events threaten to push it up. Influenced by Keynes's description of the economy in the Great Depression, and perhaps by the relative stability under the Bretton Woods system, many in the UK were sceptical about the utility of monetary policy in tempering the cycle or its centrality in controlling inflation. Just as some argue today, the prevailing view seemed to be that monetary policy was not a reliable way of affecting demand, that demand did little to prices and that inflation was determined predominantly by other, "cost-push" factors about which monetary policy could do little. As such, the UK was particularly ill-prepared to deal with the significant inflationary shocks of the late 1960s and early 1970s.

Whether it's complacency in the face of high inflation or defeatism in the face of persistently low inflation, there are risks in ignoring monetary policy as the central tool for the job.

References

Aikman, D., Bush, O., and Taylor, A. M. 2018. "*Monetary versus macroprudential policies: causal impacts of interest rates and credit controls in the era of the UK Radcliffe Report*". NBER working paper 22380, available at https://www.nber.org/papers/w22380.

Bernanke, B. S. 2020. "*The new tools of monetary policy*". American Economic Association Presidential Address, 4 January 2020.

Borio, C. 2017. "*Through the looking glass*". OMFIF City Lecture, London. Available at https://www.bis.org/speeches/sp170922.pdf.

Boyer, G. R, and Hatton, T. J. 2002. *"New estimates of British Unemployment, 1870-1913"*. Journal of Economic History, Vol. 62, pp 643-75.

Brainard, L. 2020. *"Monetary policy strategies and tools when inflation and interest rates are low".* Remarks at the 2020 U.S. Monetary Policy Forum, New York. Available at https://www.federalreserve.gov/newsevents/speech/files/brainard20200221a.pdf.

Crafts, N. F. R. and Mills, T. C. 1994. *"Trends in real wages in Britain, 1750-1913".* Explorations in Economic History, Elsevier, Vol. 31 (2), pp 176-94.

Eggertsson, G. B. and Woodford, M. 2003. "*The zero bound on interest rates and optimal monetary policy*". Brookings Papers on Economic Activity, Vol. 2003, No. 1, pp 139-211.

Feinstein, C. H. 1972. "*National income, output and expenditure of the United Kingdom 1855-1965".* Cambridge: Cambridge University Press.

Feinstein, C. H. 1991. *"A new look at the cost of living"*, in Foreman-Peck, J, ed. *New perspectives on the Late Victorian Economy*, Cambridge University Press, Cambridge.

Feinstein, C. H. 1998. *"Pessimism Perpetuated: Real Wages and the Standard of Living in Britain during and after the Industrial Revolution"*. Journal of Economic History, Vol. 58, No.3, pp 625-658.

Friedman, M. 1968. *"The role of monetary policy".* The American Economic Review, Vol. 58, No. 1, pp 1-17.

FT. 2017. "*Weak global inflation is a mystery investors must unlock*". Financial Times, 24 July 2017.

FT. 2019a. "*It could be time for central banks to ditch the 2% inflation target*". Financial Times, 19 June 2019.

FT. 2019b. "*Broken: monetary policy*". Financial Times, 26 November 2019.

Keynes, J. M. 1930. "*A treatise on money*". London, Macmillan.

Keynes, J. M. 1936. *"The general theory of employment, interest and money".* London, Macmillan.

Krugman, P. R. 1998. "*It's baaack: Japan's slump and the return of the liquidity trap*". Brookings Papers on Economic Activity, Vol. 1998, No. 2, pp 137-206.

Krugman, P. R. 2013. "*Monetary policy in a liquidity trap*". The Conscience of a Liberal, The New York Times, 11 April 2013.

Levy, A. 2019. "*The euro area Phillips curve: identification with regional data*". Working paper available at http://economics.mit.edu/files/16976.

McLeay, M. and Tenreyro, S. Forthcoming. *"Optimal inflation and the identification of the Phillips curve"*. In NBER Macroeconomics Annual 2019, Vol. 34, edited by Martin Eichenbaum, Erik Hurst, and Jonathan Parker. University of Chicago Press.

Mitchell, B. R. 1988. **"***British Historical Statistics"*. Cambridge University Press.

Nelson, E. 2001. *"What does the UK's monetary policy and inflation experience tell us about the transmission mechanism?"* CEPR Discussion Paper, No. 3047.

O'Donoghue, J., Goulding, L. and Allen, G. 2004. *"Consumer Price Inflation since 1750"*. ONS Economic Trends 604.

Phillips, A. W. 1958. *"The relation between unemployment and the rate of change of money wage rates in the United Kingdom, 1861-1957"*. Economica, New Series, Vol. 25, No. 100, pp 283-299.

Reifschneider, D. and Williams, J. C. 2000. "*Three lessons for monetary policy in a low-inflation era*". Journal of Money, Credit and Banking, Vol. 32, No. 4, pp 936-966.

Romer, C. D. and Romer, D. H. 2013. *"The most dangerous idea in Federal Reserve history: Monetary policy doesn't matter".* American Economic Review, 103(3), pp 55-60.

Sargent, T., Williams, N. and Zha, T. 2006. "*Shocks and government beliefs: The rise and fall of American inflation*". American Economic Review, Vol. 96, No. 4, pp 1193-1224.

Thomas, R. and Dimsdale, N. 2017. *"A Millennium of UK Data"*. Bank of England OBRA dataset, http://www.bankofengland.co.uk/research/Pages/onebank/threecenturies.aspx.

Vlieghe, J. 2018. "*From asymmetry to symmetry: changing risks to the economic outlook*". Speech given at the Confederation of British Industry, available at https://www.bankofengland.co.uk/speech/2018/gertjan-vlieghe-speech-at-birmingham-chamber-of-commerce.

Wallace, N. 1981. "*A Modigliani-Miller theorem for open-market operations*". American Economic Review, Vol. 71, No. 3, pp 267-274.