BANK OF ENGLAND

Speech

Why are interest rates low?

Speech given by

Jon Cunliffe, Deputy Governor Financial Stability, Member of the Monetary Policy Committee, Member of the Financial Policy Committee and Member of the Prudential Regulation Authority Board

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I left this University almost exactly 40 years ago and, armed with a Masters in English Literature, ventured out into the wider world.

There was no great expectation of making one's fortune. It was a very different world. I had no interest whatsoever in economics. But even I knew the economy was in pretty bad shape, following the oil crisis, the three day week and the recessions of the previous two years.

Even my younger, 1976, self, knew that inflation was running at 15%. To be honest that seemed pretty normal – it had been above 15% for three years. I didn't realise then that I actually had inflation expectations but had someone asked I guess mine would have been pretty high.

I am quite sure, however, that I didn't know that Bank Rate was also 15%. Banks did not like giving students bank accounts in those days let alone loans. And most had grants anyway. But as with inflation, while I might have thought 15% Bank Rate a bit high, I would not have been all that surprised – Bank Rate had been around, if not above, 10% for most of the 1970s.

So had you told me then that 40 years later inflation would be around 1% having hovered around ½% for two years, that Bank Rate would be ¼%, having been stuck at ½% for eight years, I might well have replied that this was as likely as my being invited back here in 2016, to give a speech on economics. (I might also have looked to see what you had been drinking or perhaps smoking.)

There are perhaps two lessons in this. The first is that life and the economy never quite turn out as you forecast – in the longer term at least.

The second is that in life and in economics you should never stop learning.

I want to talk today about some of the possible reasons why Bank Rate is at ¼% and has been stuck at what appears, by reference to history, to be exceptionally low levels in the UK and in other advanced economies.

And why long-term interest rates are similarly low. In 1976, you would have had to pay 11% to borrow for a year whereas the long-term rate was 16%. Today, the equivalent figures are ¼% and 2½%.[1]

Some of the difference, of course, is inflation and the inflation expectations I and everyone else had back in 1976. Bringing inflation under control in the UK in the 1990s and anchoring inflation expectations at around 2% clearly led to a material drop in nominal interest rates and a drop in the entire nominal yield curve. Operational independence of the Bank of England – with which I was heavily involved while at the Treasury, played a major part in this. But there is clearly something more going on here.

[1] The long-term rate used here is the ten-year instantaneous forward rate.

I want therefore to use two concepts of the interest rate to explore what may be going on and what we have learned and relearned about interest rates. The first concept is the trend real rate of interest and the second is the natural real interest rate (R*).

The trend real rate of interest

The trend real rate is a long-term interest rate, 10 years or more. It is the interest rate, or to put it another way, the price which balances the demand for investment with the supply of saving when the economy is growing at trend – that is when supply and demand are in balance and inflation is at its target. The level of the trend real rate depends on structural, long-lived factors that determine the supply of savings and the demand for investment.

This trend real rate cannot of course be observed directly.

We can observe the long-term nominal rate of interest on bonds. This includes compensation for inflation that might occur over the duration of the bond. It also includes a variety of so called nominal and real 'term premia'.

Term premia capture the risks that investors, having locked into a long maturity fixed-interest bond bear over the life of the bond. They are the extra compensation that investors demand to balance the fact that they will be holding a fixed interest long-maturity bond rather than simply rolling over a sequence of perfectly liquid, risk-free short-term bonds.

Work by Bank of England economists last year estimated that the trend real rate of interest in advanced economies had fallen by around 4½ percentage points over the last 30 years, from around 4½% to around 0%.[2] There are a range of other estimates which show broadly similar results.[3]

The Bank work investigates the structural changes in the supply of savings and in the demand for investment that have led to the drop in the trend real rate of interest.

It finds that the supply of savings has grown since the 1980s while the demand for investment has shrunk.

The higher supply of savings accounts for around two-fifths of the drop in the trend real rate. Demographics, as older people save more, higher inequality, as richer people save more, and the Asian savings glut, drive this higher level of global savings.

[2] See Rachel, L. and Smith, T. (2015). "Secular drivers of the global real interest rate", Bank of England Staff Working Paper No. 571.

[3] For example, estimates from term structure models such as those discussed in Meldrum, A and Roberts-Sklar, M (2014), 'Long-run priors for term structure models', *Bank of England Working Paper 575*.

The lower demand for investment accounts for nearly two-fifths of the reduction. An ongoing decline in the price of investment goods, less public investment and systematically higher credit spreads account for the reduction in desired investment.

And, alongside these changes in the levels of the supply of saving and the demand for investment, there has also been a change in the underlying return on investment. Expectations of a lower rate of real global growth accounted for another fifth of the reduction in the trend real rate of interest.[4]

Three caveats are important at this point. The first is that the Bank work estimated the reduction in the global average trend real rate and the impact of changes in the level of global savings and investment.

To the extent that global capital markets are not perfectly integrated and that there is an element of home bias in the financial allocation of savings, changes in the national supply of savings and demand for investment matter too. For example, developments in UK demographics would suggest less of a reduction in the trend real rate here than seen globally. But overall, the evidence suggests a very significant proportion of the movement in UK trend rates reflects developments elsewhere.

The second caveat is that central banks have been buying government bonds, which stimulate the economy by pushing down term premia and so longer-term real rates. But while QE has contributed to lower term premia and bond yields, much of the decline in the trend real rate pre-dates QE, and the crisis more generally, as both real expected policy rates and term premia fell. And it's worth noting that the decline in long rates has also been seen in countries where there hasn't been QE, such as Canada and Australia, although this in part probably reflects international financial market flows following falls in yields elsewhere.

Finally, this analysis of the trend real rate does not consider the possibility that trend real rates can be moved around by long financial cycles and the impact of the associated leveraging and deleveraging on interest rates. These effects could well have acted to push up on trend real rates in the long buildup of leverage before the financial crisis and to have pushed down on rates during the protracted deleveraging that followed the bust. Some of these effects will be shorter lived and are best thought of as part of the natural rate cycle to which I will return in a moment. But to the extent that these effects are longer lived they may well have pushed down the trend real rate.

And of course there is a broader caveat here. Long-run structural economic factors are hard to estimate with precision and it can be even harder to forecast their development. For example, demographics are likely to reverse some of the increase in saving as dependency ratios increase and people in retirement spend their savings. When this will occur will depend on many factors, including how long older people are able to stay

[4] The analysis by Bank staff was not the joint estimation of a single, structural model. Instead, it drew on separately estimated impacts of a variety of contributing factors - it's possible that these might overlap.

in the workforce. What is, I think, safe to say, is that the trend real rate has gone down over the last few decades, driven by structural factors.

To put it in historical context, the 10-year rate of interest in 1976 was 16%, but that has fallen to around 2½% today, reflecting very large structural changes since I left this university. Part of that fall is associated with much lower inflation rates today than were experienced in the 1970s. But also, since the early 1980s, structural factors have put downward pressure on both the expected real rate and term premia. Inflation premia are much lower now accounting for around 2½% and term premia, which are much harder to estimate, are probably around 0%, which leaves a trend rate of around zero.

The natural rate of interest (R*)

The second concept of the interest rate I want to look at today is the natural interest rate.

The natural rate of interest is quite an old concept, first posited by Knut Wicksell at the end of the 19th Century as the rate of interest at any given time that keeps the price level stable. Wicksell argued that if the market rate exceeded the natural rate, prices would fall; if it fell below, prices would rise. The economics discipline then went on an intellectual journey over the 20th Century, first largely abandoning the natural rate concept in favour of Keynes' advocacy of fiscal policy for demand management and then returning to monetary policy, albeit in the form of the famous quantity theory of money. By the start of the 1990s, however, the difficulties of targeting the growth in monetary aggregates were clear and central banks turned to interest rates as the principle instruments of policy.

Nowadays, we tend to think of the natural rate not so much as the rate that would hold prices stable at any given time but, given frictions in the economy and lags in the impact of monetary policy, as the interest rate that will close the output gap over the monetary policy horizon.

However, unlike the trend real rate, the natural rate is a shorter-term concept. The trend real rate as we have seen is determined by slow-moving structural factors that determine the underlying balance of the supply of savings and the demand for investment. But the interest rate necessary to offset the impact of unexpected outcomes – shocks – hitting the economy can vary significantly around the trend real rate over an economic cycle.

Over the economic cycle, the natural rate will lie below the trend real rate when the economy needs stimulus to offset a negative demand shock and above it when demand needs to be reined in.

The actual monetary policy rate, Bank Rate in the UK, may well deviate from the natural rate – for example, if there are so-called 'trade-off inducing shocks'. These are best thought of as shocks that would still move inflation away from target even if we were to perfectly match demand and supply. Such shocks include a

shock to the exchange rate or to competition and firms' mark-ups. Nevertheless, the natural rate remains useful to policymakers as a reference point for assessing the tightness or looseness of the monetary policy stance.[5]

The natural rate of interest cannot be observed directly any more than the trend real rate. It can be estimated through economic models though the estimates are sensitive to the models used.

Bank of England estimates, using a variety of models, suggest that the natural rate fell very sharply below the trend real rate during the financial crisis. It fell by as much as 10 percentage points according to some estimates as the shocks from the crisis – deleveraging, the slowdown in world trade and the increase in uncertainty – pushed the natural rate very deep into negative territory.[6]

Even using QE, it was difficult for monetary policy to follow the natural rate down to the level necessary to offset the shock and to close the output gap over the policy horizon. In other words, though it appeared exceptionally loose by historical standards, bank rate at ½% and a very large, £375bn, programme of asset purchases, in retrospect, constituted a tight policy setting relative to what the economy needed to offset the shock. This is perhaps one reason why the UK recovery from the post crisis recession was slow by historic standards.

It is generally acknowledged that the exceptional monetary policies implemented in the years immediately following the crisis were necessary. However, we are now eight years on and monetary policy still appears to many exceptionally loose by reference to historical rates of interest. Can this still be justified by reference to the natural rate?

My own view is that it can. The natural rate, according to most estimates, has risen since 2012 from its deep post-crisis trough. It is now closer to the zero mark but it's still likely to be negative.

Unlike the post crisis period when policy rates would have needed to be deeply negative to follow the natural rate, monetary policy is now more able to be close to the natural rate and so to keep demand and supply in balance. But it can only do so with very low interest rates or, in the case of some advanced economies, with slightly negative rates and QE.

There is a simple cross check on the model estimates of the natural rate – the actual evolution of inflation, output and interest rates over the past few years. The natural rate as John H Williams observed in response to Keynes and with some despair, is:

[5] See Figure 1 at the end of the speech for an illustrative breakdown of some of the factors affecting the appropriate real policy rate.

[6] For example, see http://bankunderground.co.uk/2015/08/11/an-estimate-of-the-uks-natural-rate-of-interest/.

> *"an abstraction; like faith it can only be seen by its works. One can only say that if the Bank policy succeeds in stabilizing prices, the bank rate must have been brought into proper line with the natural rate, but if it does not it must not have been."*[7]

In the period since the UK recovery gathered pace in 2013 and the August Inflation Report this year, Bank rate was at ½% and the stock of QE unchanged.

UK headline inflation over that period was of course affected by externally generated disinflation pressure from the sudden and very substantial drop in energy prices.

But over that period, the average of a range of measures of domestically-generated inflation in the UK fell from around 2% to ½% at the end of 2014 – it has since recovered but only to nearly 1½% which is considerably below its pre-crisis average of 2½%.

Over the same period, pay increases averaged around 2% – despite the fastest drop in unemployment in 40 years. Output growth picked up briefly to over 3% but has now fallen back to nearer 2%. And a small output gap probably persisted over the period.

The MPC's 2% inflation target is for UK CPI as a whole not for domestically generated inflation. But if we want to get a cross-check on where monetary policy was relative to where the natural rate might have been over this period, we can observe that monetary policy was not able to get domestically generated inflation to the inflation target over the policy horizon. In other words, far from being exceptionally loose, policy with hindsight may even have been a little tight.

If this is right and the natural rate is currently slightly negative, how can that low level be explained? The great shocks that hit the economy after the crisis have surely dissipated. What are the headwinds now pushing the natural rate down?

There are I think three interesting candidate explanations for this.

The first is that there are still strong demand headwinds pushing the natural rate down. These include fiscal tightening, weakness in the global economy, restoration of credit spreads to more sustainable levels and elevated risk aversion which remains as a hangover from the crisis.

The second explanation is that as well as headwinds to demand, the trend real rate itself has fallen and that the natural rate is now varying around a lower trend rate. The analysis around the time of the crisis,

[7] Williams, J. H. (1931): "The Monetary Doctrines of J. M. Keynes," *Quarterly Journal of Economics*, 45(4), 547–587.

including that just described, tended to ascribe the low level of the natural rate to the size of the demand headwinds. Since then, we have learned to be more aware of the structural decline in the trend real rate.

This would suggest that some of the low level of the natural rate is due not so much to demand headwinds pushing the rate away from the trend real rate but from the drop in the trend real rate itself. The stance of monetary policy relative to the natural rate remains the same of course. But in this view of the world, we can perhaps expect the natural rate to stay lower even as the headwinds abate.

The third candidate explanation is that central banks are the architects of the apparently low trend real rate by pushing up demand for long-dated risk free assets. This argument is, I think, largely mistaken for some of the reasons I alluded to earlier.

QE will have affected the price and hence the yields on bonds. Indeed, that is part of the objective. Central banks make use of asset purchases when their preferred policy instruments run into their effective lower bounds. But QE will not have affected the natural rate. QE acts as a substitute for changes in Bank Rate, taking the effective or "shadow" policy rate – Bank Rate adjusted for the impact of QE – down below zero and towards the extraordinarily low natural rate. In other words, central banks are not causing low underlying interest rates, we are responding to them.

Policy Implications

What are the policy implications in a world in which the natural rate remains around zero and all else equal will not rise back to close to pre-crisis levels even as headwinds abate?

I think there are two main implications for central banks. First, and most obviously, if the natural rate is going to be lower on average then the same will be true of the policy rate. This has been recognised in the view of most central banks in advanced economies who have made it clear that when policy rates go up they are likely to do so slowly and to levels materially below those we saw before the crisis.

Second, while I believe central banks do have the tools to offset shocks to the real economy and to fulfil their mandates, these tools become increasingly more complex in their effects in a world in which the natural rate is low.

I would briefly mention two aspects of this.

Monetary policy at very low levels of the natural rate can have implications for the financial sector – both in the way the sector is able to transmit monetary policy and in broader impacts on the price of financial assets.

These effects can be managed. In August, the MPC specifically addressed the implications of its recent policy package on banks' interest margins; it took action to prevent these jeopardising the transmission of its policy stimulus.

And, to the extent that monetary policy at these levels has an undesirable impact on financial assets and indebtedness, the development of macroprudential policy is intended to address these directly and more generally to make the financial system more resilient to shocks.

On a different note, one cannot ignore that monetary policy has a distributional impact.

All sectors of the economy and all parts of society benefit from price stability and lower volatility in economic growth. It can be very painful for both the economy and society to correct entrenched inflation – as I learned when I left this university in the mid-1970s – or indeed entrenched deflation.

But monetary policy works through many channels in the economy. It affects borrowers and savers. It affects wealth – the value of houses and financial assets. It affects jobs and pay. And the impacts on individuals can be difficult to disentangle. Low rates, for example, can increase housing wealth and the value of pension investments while reducing the return on savings accounts.

And to the extent that by smoothing the volatility of output monetary policy can prevent the adjustment to economic shocks leading to more persistent damage to the economy, it can prevent longer lasting loss of jobs and loss of pension values. A pension, after all, is in the final analysis a claim on the future economy – it is an investment, public or private, that has to be paid out of future revenues, dividends, capital values and taxes.

However, these effects can be felt more powerfully when policy rates are at what appear to be very high or very low absolute levels.

We are of course explicitly mandated to make difficult trade-offs. Most notably, when inflation is off track, they have to balance the speed with which it is brought back to target against the impact on growth.

But while central banks need to be mindful of the possible side-effects of their policies, I would caution against requiring them to make more granular distributional judgments. Low and stable inflation and smoothing output volatility are public goods that benefit all; technocratic central bankers should use the tools available to them to achieve that public good and avoid as far as possible taking views on distribution. Distributional considerations and decisions should remain the province of elected authorities that have many instruments to address these issues.

I have discussed some of the policy implications of a low natural rate for central banks generally. In the UK, of course, Bank policy is now focused on assessing and, where necessary addressing, the implications for the economy over our policy horizon – the next two to three years – of the UK's forthcoming exit from the European Union.

I don't need to say too much about this today. The minutes of the MPC's November meeting and the November Inflation Report give a detailed picture about the Committee's current forecast and policy stance to which I fully subscribe. But there is one point that is relevant to the analysis I have just laid out on the natural rate.

As I said earlier, the policy rate may need to depart from the natural rate if the policymaker is faced with a shock that creates a tradeoff – for example between bringing inflation to target and smoothing output volatility. The impact of the depreciation of sterling on future inflation has increased the salience of such a trade-off for the MPC.

As the Committee has made clear, there are limits to the extent to which above-target inflation can be tolerated. These limits depend inter alia on what is driving the inflation overshoot, on the impact on inflation expectations and on the scale of the output gap. The exchange rate shock has made it more difficult for policy to follow the natural rate.

And finally, I have discussed the implications of a low natural rate and low real trend rate for central banks. But the implications of course go much wider than that. A secular period of very low underlying interest rates would pose many challenges.

If, as I have suggested, the forces pushing down on interest rates might be less cyclical than we had thought and more secular, authorities with a longer policy horizon and with instruments more enduring in impact than monetary policy are best placed to address such challenges.

A key and well recognised challenge in this respect is to raise the growth rate of productivity in advanced economies which will in turn raise the return on investment and hence the trend real rate of interest.

Another might be to address the imbalance in the supply of savings and the demand for investment that appears to have pushed the trend real rate down. On the first, the shift of China to greater openness and more consumption-driven growth, which seems to be underway, may if it continues help reduce the supply of savings as would policies to reduce inequality.

On the second, the reduction of public investment in advanced economies over the last 30 years has clearly played a part in reducing the demand for investment. Some reversal in that trend internationally would be likely to push up the trend rate of interest. It might also help raise the rate of growth of productivity. In this

respect, it's worth noting that the leaders of the G20 have recognised the importance of high-quality public investment.[8]

The answers to these challenges are not simple. Structural change to raise productivity can be very difficult; it often means there will be losers and winners. Likewise, fiscal policy needs to balance public spending with sustainability through time.

These are certainly not, I readily admit, issues for central bankers. It is not so much that we have our plates quite full meeting our much narrower and shorter-term mandates – though that is surely true. It is that, more fundamentally, these are decisions and actions that only governments can and should take.

I have set these long-term trends out today with a little bit of trepidation. One of the things I have learnt is that the moment policymakers start to talk about long-term trends, the trends change. And there is a sense of change in the air. We've seen an increase in interest rates recently driven by international political developments and an increase in inflation expectations. To the extent that they presage longer-term changes in economic policy, they could perhaps affect the natural rate of interest and perhaps even the longer-term trend rate.

Conclusion

Things do change. As I said at the start, I left this University at what even a 1970s Arts graduate could see was a pretty bleak period in UK economic and political history.

It was by no means clear that the UK could ever wean itself off inflation. Indeed, the economics profession at the time had by no means reached a consensus on whether there was a long-run tradeoff between inflation and employment.

Nor was it at all clear that supply side, structural reforms could ever happen, given the political economy at the time.

And it was only a year after the UK's first referendum on membership of the EU – which had generated quite a stir in the Students' Union – and there was a lot of uncertainty as to where it all would lead us.

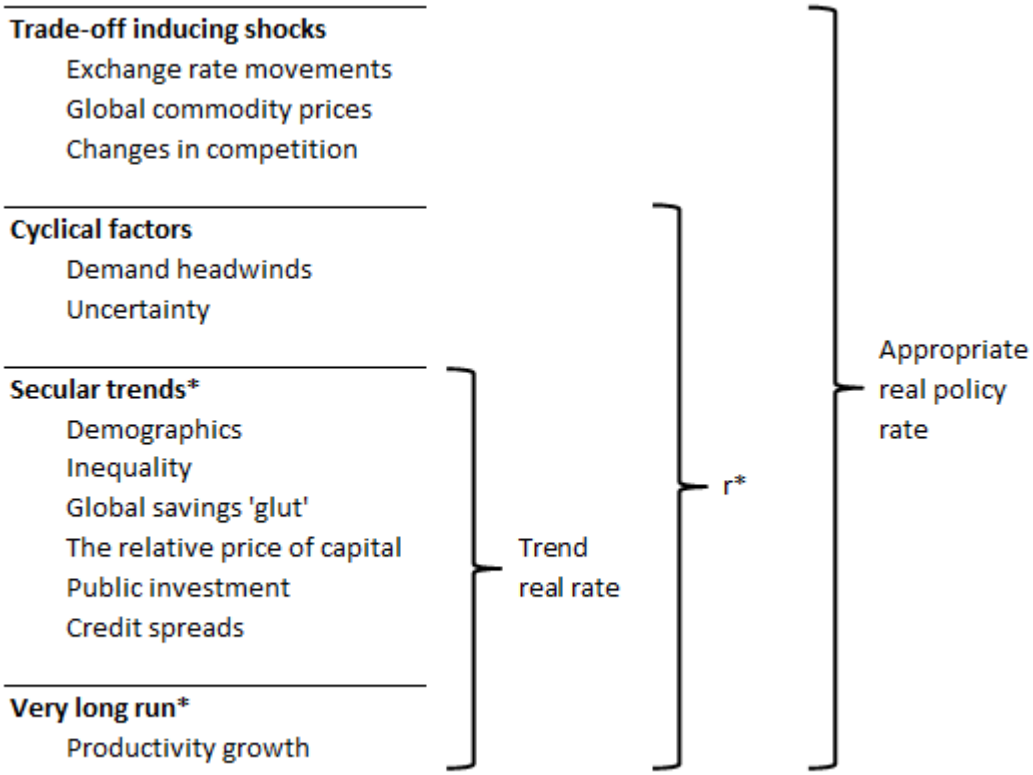
I would certainly not have imagined that 40 years on anyone, let alone I, would be talking about getting inflation *up* to target and the problems of low interest rates. I am very sure that if, as is pretty likely, one of you will be back here in 40 years talking about economic policy challenges, it will be about something that is now hard to imagine.

[8] See G20 Leaders' Communique Hangzhou Summit, http://www.g20.org/English/Dynamic/201609/t20160906_3396.html.

I guess that in the end, that is why despite my enduring affection for the Arts, I do not miss my first profession. The challenges of economic policy making are constantly changing; the learning, it seems, never stops. And though one never gets one's forecast right, the rewards to good policy are great.

Thank you.

Figure 1 Illustrative breakdown of some of the factors affecting the appropriate real policy rate



* Elements in these may also appear in other categories.