## The 2017 Harold Wincott Memorial Lecture

# CENTRAL BANKING AFTER THE GREAT RECESSION

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### Introduction

The UK's inflation targeting framework is now a full quarter of a century old, while the Bank of England's Monetary Policy Committee has just celebrated its 20th birthday. For the first 15 of those years, growth was steady and inflation close to target. Indeed, according to the available statistics, it was the most stable period since the dawn of the Industrial Revolution. No wonder Mervyn King christened it the 'NICE decade' – Non-Inflationary Consistently Expansionary. And, of course, the UK was not alone: many other advanced economies were enjoying similarly benign macroeconomic conditions. Nudging policy rates up or down in the region of 4–6 per cent served to keep our economies growing and inflation on track. We thought we had this central banking malarkey well and truly cracked.

After Hubris, of course, came Nemesis, in the shape of the 2007–08 North Atlantic Financial Crisis and its sibling the 2010–12 Euro-Area Debt Crisis. The task of maintaining macroeconomic stability turned out to be far harder than central bankers imagined, while the recovery after the twin crises has been agonisingly slow. Policy rates have been near their effective floor for almost a decade, while central bank balance sheets have ballooned as a result of large-scale asset purchases. A major tightening of the regulations governing banks and other financial institutions is under way. And we are all trying to work out how to design and implement macro-prudential policies effectively. Central banking has never looked more daunting.

In my remarks this evening, I want to reflect on some of the challenges facing today's central bankers. Are we just passing through a period of purgatory before normal service is resumed? Or are we confronted by a new world that demands more radical solutions?

### Context: the low natural real interest rate

Let me start with a few words about the underlying economic context, and especially the apparent decline in the underlying real rate of interest consistent with macroeconomic equilibrium – the Wicksellian natural real rate of interest. While central banks can, within reason, set any policy interest rate they like in the short run, if they are going to achieve their inflation objective the nominal policy rate will necessarily converge to the sum of the natural real rate of interest and the target

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inflation rate; if the policy rate is consistently held lower (higher), then there will be excess (insufficient) aggregate demand relative to the economy's capacity and, at least with a conventional Phillips Curve relationship, inflation will explode (implode). The natural real rate of interest is therefore of central importance as, for a given average inflation rate, it will determine the average level of nominal interest rates. It will also determine how much room for manoeuvre the central bank has before it runs up against the effective lower bound on policy rates that arises because banks always have the option of turning their reserve deposits into cash, while households and businesses always have the option of holding cash rather than bank deposits.

Now we cannot observe the natural safe real rate of interest directly. But if market participants expect output in the future to be roughly in line with potential – as would be necessary if the inflation objective is to be met – then the long-term real interest rate on relatively safe bonds ought to provide a rough guide to it. Figure 1 therefore shows a measure of the 'world' ten-year risk-free real interest rate, derived from the inflation-indexed sovereign bonds of the G7 countries (excluding Italy) by King and Low (2014). Notably, this has fallen steadily from around 4 per cent in the mid-1990s to around zero today and is clearly not just a reflection of the extraordinary monetary policies adopted after the financial crisis.

It is also worth noting that this appears to be a relatively unusual period, historically speaking. The only analogous period in the past couple of hundred years when the underlying real rate of interest appears to have been so low for so long is the decade or so after World War II (see, for instance, Reinhart and Sbrancia 2015; Hamilton et al. 2015). But this was a time when market interest rates were subject to caps and segmented capital markets ensured a captive domestic audience for government debt – so-called 'financial repression' – and not at all like the contemporary world of liberalised financial markets.

An important corollary of this substantial fall in the natural real rate is that central banks have ultimately had little choice but to accept that their policy rates need to be at least four percentage points lower today than 20 years ago. Criticisms from politicians and commentators that such policies are penalising savers, driving up asset prices, and so on, rather miss the point that the decline in real and nominal rates over the past 20 years ultimately reflects underlying real forces in the world


**Figure 1:** 'World' ten-year risk-free real interest rate.
*Source:* King and Low (2014), updated.

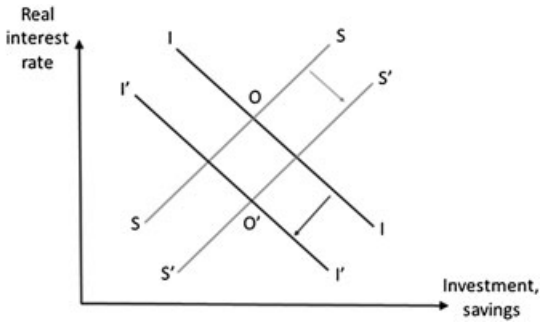


**Figure 2:** Global capital market.

economy that central bankers are powerless to change. Nevertheless, the fact that technocratic central bankers make the proximate decision as to the level of interest rates plays into some of the political economy considerations that I will come to later.

The conventional framework for thinking about the factors driving the downward trend in the natural real interest rate is portrayed in Figure 2, which shows the international market for loanable funds, together with the corresponding natural real rate of interest. The figure is drawn making the conventional assumption that substitution effects dominate income effects, so that saving (SS) is increasing in 'the' real interest rate, while investment (II) is decreasing. Clearly the observed fall in real interest rates is potentially attributable either to an exogenous fall in the propensity to invest (i.e. a leftward shift in the II schedule) or an exogenous increase in the propensity to save (i.e. a rightward shift in the SS schedule) or to some combination of the two. Identifying which, together with the underlying causes, is clearly important for evaluating the likely future path of the natural rate.

What does the evidence suggest about the relative importance of shifts in savings and investment propensities in the past? Figure 2 suggests that the behaviour of the global savings/investment ratio should help identify which is to blame. Figure 3 shows the savings/investment share for the world.

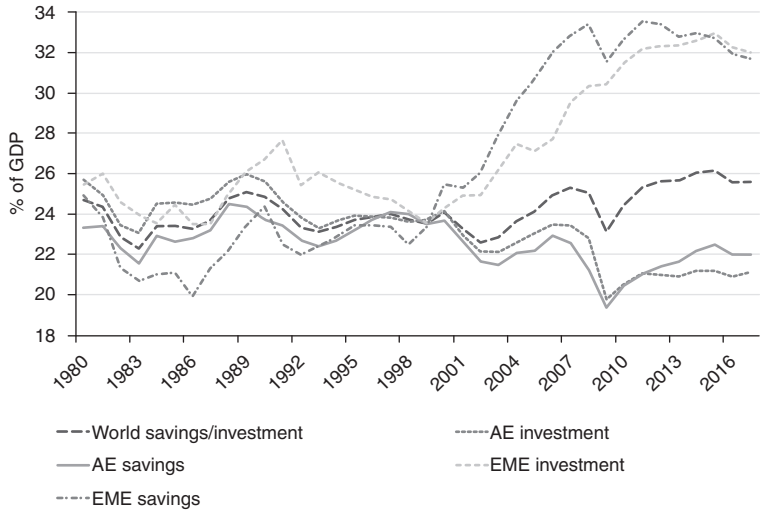


**Figure 3:** Savings and investment shares (% of GDP).
*Source:* IMF World Economic Outlook database.

The savings and investment shares for the advanced economies (AE) and the emerging and developing economies (EME) are also shown separately, with the corresponding gap between savings and investment reflecting the region's external surplus or deficit.

In fact, the global savings/investment share has been surprisingly stable, with just a very modest upward trend in the years leading up to the financial crisis, a sharp decline during the Great Recession, followed by a resumption of the gentle upward trend. That suggests that both sorts of factors have indeed been at work, with savings factors slightly dominating for much of the period, coupled with a sharp and persistent fall in the propensity to invest following the financial crisis.

There is now quite an extensive literature on the possible sources of the shifts in savings and investment propensities. When the downward trend in underlying real interest rates was first spotted, Bernanke (2005) famously laid the blame on a 'savings glut' in China, reflecting low fertility rates, an inadequate household safety net, and underdeveloped domestic financial markets.

Demography is, however, likely to have had a more widespread impact on saving behaviour. To begin with, longevity has been increasing, unmatched by an equi-proportionate rise in retirement ages. That should tend to raise the savings rates of those in work. But the composition by age is also important. Broadly speaking, the young consume what they get, the middle-aged save during their peak earning years, and the old dissave. Consequently, the difference in the population shares of the middle- and old-aged cohorts is important in determining aggregate savings propensities. Figure 4 shows the past and prospective evolution of the population shares of the middle-aged (40–64 years of age) and the old (65 years and older) for the world excluding China, and for China, where the demographic structure has been changing especially rapidly. The figure also shows the difference between the two cohort shares as, together with their respective income profiles, this is what really matters for aggregate savings. This difference has been rising steadily for the past couple of decades, has just peaked and is projected to fall quite sharply over the next three decades. The coincidence of the timing of the upward leg of the difference in population shares with the trend downwards in real interest rates is highly suggestive.

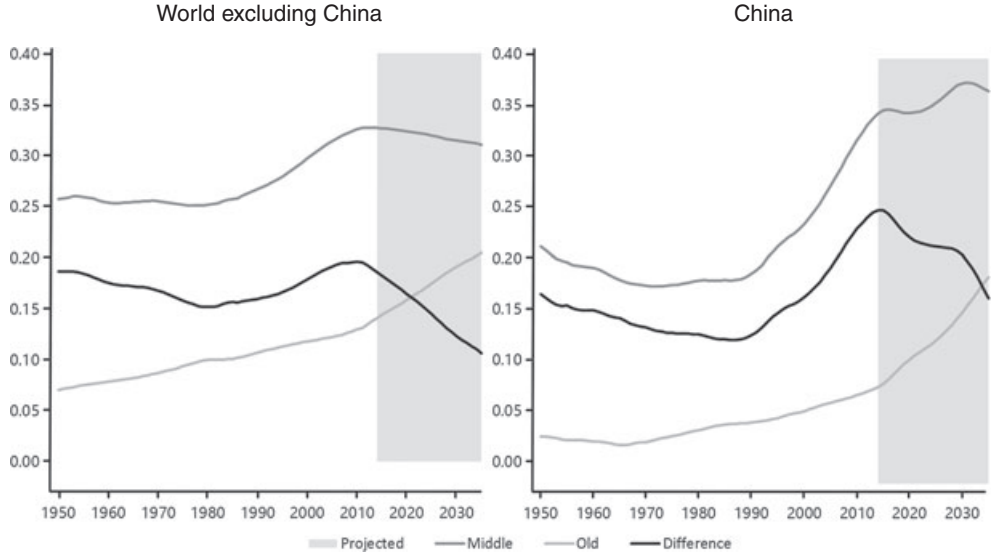


**Figure 4:** Past and projected population shares for (*a*) world excluding China and (*b*) China.
*Source:* United Nations.

Finally, the financial crisis and the regulatory response has led banks to shrink their balance sheets, which in turn has been associated with a tightening in the supply of credit. Moreover, highly indebted households and businesses have also cut back spending in order to reduce their vulnerability to future adverse shocks. This must have been an important factor in the past few years.

As far as shifts in the propensity to invest are concerned, weak aggregate demand and heightened uncertainty since the financial crisis have surely played a role. In Summers' (2013, 2014) 'secular stagnation' thesis this is exacerbated by the constraints on monetary policy imposed by the interest rate lower bound and the unwillingness of governments to use fiscal policy more aggressively, leading to a malign feedback loop.

Authors such as Gordon (2016) have gone further, arguing that the weakness in investment is more deep-seated and driven by dwindling opportunities for innovation, together with slowing growth in the working population. Gordon, for instance, argues that the rapid growth of the past 250 years was on the back of three great 'general-purpose' innovations – the steam engine and the railroads; electricity and the internal combustion engine; and the digital revolution – and that the main gains from these have now been realised, so that the rate of total factor productivity growth is returning to the slower rates experienced before the Industrial Revolution.

Were this to be the case, the future would indeed be bleak. But personally I do not find this argument that persuasive, which seems to speak more to our limited abilities to see what possibilities the future may hold. While productivity growth has certainly been weak over the past few years – on both sides of the Atlantic – much of that may just be a legacy of the financial crisis and will fade in due course.

Moreover, past experience suggests that it can take a long time for the effects of new technologies to be fully felt. For instance, the 1970s and 80s saw a similar productivity slowdown, leading Robert Solow famously to remark in 1987 that 'You can see the computer age everywhere but in the productivity statistics', just before it finally *did* show up in the data! With us only just beginning to explore the possibilities of artificial intelligence (AI), it seems rather premature to conclude that the digital revolution has run its course (for more in this vein, see Brynjolfsson and McAfee 2011). Moreover, other recent scientific advances, such as nanotechnology and genetic engineering, also offer extraordinary future possibilities (Mokyr 2013).

The foregoing discussion treats the factors driving savings and investment as exogenous to monetary policy decisions. Economists at the Bank for International Settlements, most notably Claudio Borio, take a somewhat different view. In particular, he has argued that while setting the policy rate in line with the Wicksellian natural real interest rate may be consistent with achieving macroeconomic equilibrium today, it may nevertheless be associated with growing financial imbalances that are prone to result in a future financial crisis, requiring an even lower natural rate subsequently in order to maintain short-run macroeconomic equilibrium (e.g. Juselius et al. 2016). Hence, the economy moves through a sequence of ever larger boom–busts in financial markets, even though inflation out-turns point to the achievement of macroeconomic equilibrium.

This is an important qualification. Indeed, one does not need to assume periodic financial crises to make the argument fly. Monetary policy operates through a variety of channels, the primary consequence of which is to encourage private agents to bring forward spending from the future to the present. It is thus well suited to filling in temporary shortfalls of demand relative to supply. It is less well suited to making good long-lived shortfalls in demand. Stimulatory monetary policy should be a bridge rather than an ever-extending pier. A better response to a problem of weak demand when the natural real interest rate is low is to look to fiscal and structural policies that encourage investment and discourage saving.

A key issue is whether or not the current state of affairs is the new normal. The prospective rise in the population share of the retired relative to that of the middle-aged provides one reason for expecting some upward pressure on the future natural real interest rate. And though the AI revolution may well pose difficult social challenges, it should at least lead to an increase in the demand for funds to invest in robots and the like. So there are, I think, some reasons to expect the natural interest rate to recover. And were that to happen rapidly, it could be associated with sharp falls in asset prices. But just as the original decline took a couple of decades, so it seems likely that the reversal will itself be gradual. Central banks will therefore need to operate against the background of a low natural real interest rate for some while yet.

## The implications for monetary policy

As noted above, the most obvious consequence for central bankers of a low natural real interest rate is that, for a given average inflation rate, the effective lower bound (ELB) on policy rates is more likely to bite. Before the crisis, this was thought to be only a minor issue in the prevailing benign macroeconomic climate, where such episodes would be infrequent and short-lived (for example, Reifschneider and Williams 2000). Recent experience clearly suggests such optimism was unwarranted: a lower natural rate coupled with larger and more persistent adverse demand shocks means that such episodes are likely to be both frequent and persistent.

In such circumstances, there are broadly two approaches when the ELB bites. The first is directly to relax the ELB constraint in some way. The second is to raise demand today by lowering future interest rates instead.

### *Relaxing the ELB constraint*

The most obvious way to relax the ELB constraint would be to raise central bank inflation targets from 2 per cent to, say, 4 per cent, thus providing an extra two percentage points room for manoeuvre (for example, Blanchard et al. 2010). This seems like a no-brainer, but there are at least three counter-arguments. First, 2 per cent inflation is probably near enough to price stability for households and businesses largely to ignore it but that ceases to be the case when inflation is running at 4 per cent; being able to forget about inflation probably has considerable social value even if it does not figure in economists' models. Second, even though it might have been helpful if inflation targets had been higher at the outset of the crisis, raising them when many central banks have been struggling even to meet their current targets is hardly conducive to maintaining credibility. Finally, an increase in the inflation target could also engender expectations that fiscally challenged governments might be tempted to press for even higher inflation in order to inflate away the real value of nominally denominated debt, generating a rise in the inflation risk premium.

Instead, central banks could seek to relax the nominal lower bound constraint itself. Here several more exotic options have been suggested: removing scope for avoiding negative interest rates by getting rid of cash altogether (Rogoff 2016); raising the opportunity cost of holding cash by taxing it (Gesell 1916); and letting the price of cash relative to reserves fall over time (Buiter 2009, after Eisler 1932). The first two are likely to be politically unpopular, especially as their overt purpose is to make it more costly for people to transfer purchasing power over time, while the last has the same effect indirectly.

### *Manipulating the yield curve: forward guidance*

In practice, central banks near the ELB have relied on boosting aggregate demand by pushing longer-term real interest rates down instead, either through steering market expectations of future policy rates downwards ('forward guidance') or through large-scale asset purchases ('quantitative easing').

In the academic variant of forward guidance, committing to keep policy rates 'low for long' lowers the future real interest rate not only by lowering the future nominal interest rate but also by generating excess future inflation (Woodford 2012). Such a policy is, however, time-inconsistent, as once the emergency is over the central bank has no incentive to validate its past promise to generate an inflationary boom while policymakers cannot tie the hands of their successors. Consequently, promises that rates will stay 'low for long' are only likely to be credible for a rather short period ahead.[1]

In practice, such guidance has been more directed to better communication of central banks' reaction functions – what is sometimes referred to as 'Delphic' guidance – rather than an 'Odyssean' attempt to implement a time-inconsistent policy path (Moessner et al. 2015). Certainly that was the intention of the guidance introduced by the Monetary Policy Committee (MPC) in August 2013, which linked even the mere contemplation of a policy rate increase to unemployment falling to at least 7 per cent so as to pre-empt a premature rise in market interest rates. Commentators and market participants, however, focussed on the central projection for when that condition would be met, essentially turning a statement about a reaction function into an unconditional expectation about when rates would rise. But, of course, the failure of productivity growth to recover as expected meant unemployment reached the critical point of 7 per cent much earlier than we anticipated, leading to scorn about the value of MPC's forward guidance. In my view, this episode provides a good illustration of the potential pitfalls in trying to communicate even reasonably simple state-contingent policy guidance.

### *Manipulating the yield curve: asset purchases*

In any case, the more important weapon in dealing with the current ELB episode has been purchases of assets – typically, though not exclusively, longer-term government bonds – by the central bank, paid for by the creation of more bank reserves ('quantitative easing' or QE for short). In the US, euro area and UK, central bank balance sheets have swelled to around a quarter of annual GDP, while in Japan it is nearer 100 per cent.

The transmission mechanism of QE potentially operates through three channels: a portfolio-rebalancing channel, whereby the reinvestment of the proceeds from the asset sales into substitute assets results in a generalised rise in asset prices, so lowering the cost of capital and raising spending through wealth effects; a bank-liquidity channel, whereby the increase in bank reserves prompts an expansion in credit supply; and a signalling channel, whereby asset purchases reinforce expectations that policy will remain accommodative. On the Monetary Policy Committee, we placed most weight on the first of these and event studies, of which there are now quite a few for several jurisdictions which suggest that asset purchases equivalent to 10 per cent of GDP can be expected to lower ten-year bond yields by 50–100 basis points (see, for instance, the studies referenced in Gagnon 2016), though there are reasons to expect the effects to be more pronounced when markets are dysfunctional.

Could the central bank ever run out of assets to buy? This seems difficult to imagine as purchases need not be confined to government bonds but could include private credit instruments, equities, housing, even fine art. And those assets could be foreign as well as domestic in nature. So the logical

limit to central bank asset purchases is an awfully long way off. But buying a broad range of private assets does take the central bank into territory that is more naturally the domain of the fiscal authorities and carries implications for the institutional set-up governing monetary policy. I shall say more on this later.

QE has, it is fair to say, been somewhat controversial, and has become more so over time. Some of this criticism is misplaced but some has more substance. The misplaced criticism is that QE 'distorts' market prices. It is certainly true that QE affects market prices – that is its aim. But in what sense is it a *distortion*? Bank reserves paying the policy rate are very similar to short-term Treasury Bills, the main difference being that only commercial banks can hold reserves. So conventional QE is akin to a debt management operation that shortens the duration of the consolidated public sector's (i.e. amalgamating the central bank into the public sector) liabilities. We do not get exercised about the Debt Management Office's issuance decisions, so why should we be so concerned about the Bank of England altering the structure of public debt for macroeconomic reasons?

A more salient criticism is that, by raising asset prices, QE has a distributional impact, benefitting the asset-rich and penalising those planning to accumulate assets. It therefore benefits not only the wealthy but also older people, while the young lose out.[2] Of course, conventional interest rate policy in normal times has distributional effects: raising rates benefits savers and harms debtors, as well as destroying jobs (and vice versa). But, by and large, the movements are seen as temporary and are accepted as a necessary by-product of the central bank pursuing its mandate to stabilise inflation. In principle, QE should be viewed in the same light, but in practice, to the uninformed (or cynical) observer, it looks like a policy to help the rich. Whether the monetary policy remit needs to be modified to take account of such distributional concerns is something I also return to below.

## *Helicopter money*

Before turning to the governance of monetary policy, however, I want to take a little detour on the subject of 'helicopter money', which some have advocated as an antidote to a lack of aggregate demand at the ELB, especially when fiscal space is limited (see, for example, Bernanke 2002; Buiter 2014; Turner 2015).

In his classic paper on the optimum quantity of money, Friedman (1969) imagined a permanent monetary injection accomplished by showering the economy with dollar bills from a helicopter. Because this extra cash is costless to produce but valued by households, it raises wealth and aggregate demand. Analytically, it is equivalent to a bond-financed temporary income tax cut combined with conventional, though permanent, quantitative easing in which the central bank buys the newly issued bonds and then keeps them on its balance sheet indefinitely. The monetary leg of this means there is no problem of Ricardian equivalence that might arise if only the first leg were carried out.

Now, unlike some central bankers, I do not object to such a policy on principle, provided that it is undertaken in pursuit of the central bank's monetary policy objectives rather than to bail the government out of a fiscal hole. But there are two substantive practical issues.

First, while the injected cash pays no interest, once that cash is deposited in banks it will be converted into bank reserves that do bear interest (remember that reserves are very similar to Treasury Bills). Consequently the policy in practice creates an additional liability of the consolidated public sector (government plus central bank), so potentially reintroducing a problem of Ricardian equivalence. This could only be avoided if banks' reserve holdings are somehow compensated at a lower rate.

Second, the monetary injection is supposed to be permanent. But central banks can always withdraw the extra high-powered money by selling assets if it is necessary to meet their monetary policy objectives: in effect, the Friedmanite helicopter also has a big vacuum cleaner attached! As today's government and central bankers cannot constrain their successors, how then is the original injection to be made credibly permanent, especially as it constitutes just a part of the stock of high-powered money?

Indeed, one can go further. The monetary injection will turn out to be permanent if, but only if, it is consistent with meeting the inflation objective in the future. And, of course, that is equally true of the quantitative easing already undertaken; it will be unwound if, and only if, it is consistent with meeting the inflation target in the future. So I cannot see that there is some distinctly new and untried policy here that is yet to be enacted by governments and central banks. Rather, like Molière's Monsieur Jourdain, they have been doing it already.

## *The governance of monetary policy*

Let me now turn to the governance arrangements for monetary policy. Academics are sometimes wont to talk about 'central bank independence' as though the central bank is a distinct and separate institution from government. The reality could not be more different. All central banks are ultimately creatures of the state, either in actuality or potentially. They derive their powers from the state and the state can take those powers away should it wish. The one possible exception is the European Central Bank, which derives its powers by virtue of an international treaty, with a new treaty being necessary to rescind or expand them.

Consequently, rather than talk about central bank independence, it is more helpful to think in terms of the tasks that are delegated to it by government and where the precise arrangements governing the principal–agent relationship may vary according to the nature of the task in question. A central bank may be delegated a high degree of independence for some of its functions, but have very little in others.

When does it make sense to delegate a function? There are several relevant criteria.

First, there has to be a good reason for delegation rather than the principal (government) carrying out the task. That could be because of the technical complexity of the task – that applies for bank supervision, for instance. Or the principal may place too much weight on short-term objectives relative to the long term. That is relevant for monetary policy, where there may be a temptation to exploit the short-run Phillips Curve in order to generate higher activity, even though in the long run it just leads to higher inflation.

Second, if the task is delegated, it needs to be properly delegated and not subject to discreet influence from the principal. But, as a quid pro quo, the agent also needs to be accountable for delivery of its mandate. That seems to be a minimum requirement in a democratic society. It thus requires both a well-defined goal against which performance can be assessed and appropriate mechanisms for public accountability, such as appearances before representatives of parliament.

Third, the execution of the agent's task ideally needs to have only limited impact on other objectives that are not within its remit and that are the responsibility of the principal, or else be open to mitigating action by the principal. Obvious examples here are fiscal and distributional consequences.

Broadly speaking, I think the monetary arrangements introduced by the new Labour government in 1997 have proved to be pretty well designed. At least during my time on the Committee, the government never once attempted to influence our decisions. Inflation has on average been close to target and the volatility of inflation has been quite low. And the specification of the remit, which

allows the MPC to accept temporary deviations of inflation from target in order to limit the volatility of output and employment, has allowed it to respond sensibly to supply shocks – it has not behaved as an 'inflation nutter'.

Some critics claim that the regime failed because it resulted in an excessive focus on stabilising inflation and ignored the consequences for financial stability and thus contributed to the financial crisis and subsequent Great Recession. To me, though, the true failure lay not in the monetary policy regime but rather in the prevailing pre-crisis wisdom that financial institutions could be trusted to handle the risks on their balance sheets appropriately, and in policymakers' lack of appreciation of the consequences of a plethora of distorted incentives. Even if the Chancellor's remit to the MPC (and the statutory objectives of the US Federal Reserve and the European Central Bank) had included an explicit mention of financial stability, I doubt that it would have resulted in much difference in monetary policies. That said, I think the addition in 2013 of financial stability risks as a reason for the MPC to choose to undershoot the inflation target, when they cannot be dealt with through macro-prudential policies,[3] is an eminently sensible modification that allows explicitly for the sort of 'leaning against the wind' policy advocated by the Bank for International Settlements (see, for example, Borio and White 2003; White 2006, 2009).

The key question, however, is whether the regime remains fit for purpose in a world of persistently low natural real interest rates and periodic large-scale asset purchases. In such a world, the distinction between monetary and fiscal policy becomes increasingly blurred, while distributional consequences also become more prominent.

Let me start with the fiscal aspects. On the presumption that the central bank's profits ultimately belong to the exchequer, monetary policy will have fiscal consequences even in normal times as it affects the intertemporal consolidated government budget constraint through its impact on seigniorage (it also has indirect effects via tax revenues and unemployment benefits, of course). But because the monetary base in advanced economies is typically quite small relative to GDP in normal times, the flow of seigniorage is typically also pretty small.

The management of the central bank's balance sheet becomes a more significant fiscal issue when there are large quantities of government bonds or private sector assets on one side, matched by a corresponding issuance of reserves on the other. Asset purchases will typically take place when the policy rate is at or near its ELB and the yield curve is upward sloping. They will therefore tend to benefit the exchequer. As an illustration, the Bank's Asset Purchase Facility (APF) currently passes over more than £10 billion a year to HM Treasury. By contrast, periods of monetary policy tightening will reduce the fiscal contribution of the central bank, potentially increasing tensions with the Treasury. As that effect is larger the bigger is the central bank's balance sheet, it makes sense to start the process of shrinking the balance sheet early during the exit from an ELB episode.

Fiscal considerations are even more prominent if the central bank buys private credits. If the central bank buys assets without government consent which subsequently default, then it is likely to find itself under attack for squandering public money. Moreover, choosing what to buy represents an intervention in the allocation of credit, and invites political pressure to intervene to support certain businesses, industries or regions or censure for supporting businesses that are behaving badly.[4] And purchasing equities in any scale is even more contentious as it involves the acquisition of control rights; that is, it is equivalent to part-nationalisation, something that is deeply political. The central bank can seek to avoid this by committing not to exercise those rights, but the pressure to intervene may become intense if the company in question is taking politically sensitive decisions (e.g. paying excessive bonuses, relocating production abroad, and so on).

For all these reasons, the fiscal authorities need to be represented and to 'own' the fiscal consequences of the central bank's asset purchase decisions. Here, I think, the APF is well designed being an off-balance-sheet vehicle in which the Treasury fully owns the economic interest, even though the MPC decides the quantum of assets to purchase. Moreover, whenever the MPC wants to increase the stock of assets held there is first an exchange of letters with the Chancellor of the Exchequer to solicit his or her consent.

The contrast with the US experience is instructive. There, the Treasury's response to the crisis was somewhat hamstrung by its relationship to Congress. Instead, the Federal Reserve took a range of actions that strayed into fiscal and political territory, relying on the powers granted to it under Section 13(3) of the Federal Reserve Act, which allow it to use its instruments as it sees fit in 'unusual and exigent circumstances'. However, there is a significant body of opinion on Capitol Hill, especially within the Republican Party, which holds that the Fed went too far in its actions, resulting in subsequent moves to limit the Fed's powers and to increase its accountability.

What about distributional concerns? While the distributional consequences of asset purchases are, to a large extent, just a reflection of the underlying real equilibrium, that will not insulate the central bank from political and popular pressure to pursue alternative policies, exemplified by Theresa May's remarks in her first party conference speech as Prime Minister.[5] That invites the question of whether the mandate for the MPC should be modified to include distributional considerations explicitly as a legitimate reason for missing the inflation target, alongside the accommodation of cost shocks and financial stability concerns.

I confess such an extension would worry me greatly. It is one thing for the MPC to use its 'constrained discretion' to limit the volatility in employment in the face of supply or cost shocks. It is quite another for the MPC to choose to refrain from cutting interest rates or undertaking asset purchases in order to protect one segment of society at the expense of another. That goes to the heart of what politics is about and such decisions should not be left to technocrats. If the government of the day is unhappy about the 'bad side effects' of the monetary policies necessary to maintain macroeconomic stability, then it seems more appropriate for them to take appropriate mitigating fiscal action instead. And, *in extremis*, if a government was set upon the need for a different monetary policy, it would be better to do it openly by invoking the override clause in the MPC arrangements, thus making explicit that it is the decision of elected politicians, not technocratic central bankers.

## Financial stability

I cannot finish without also saying a few words on the maintenance of financial stability. Central banks, with their ability to supply unlimited amounts of the ultimate settlement asset, have long held a key role in responding to financial panics. The financial crisis saw substantial innovation in lending facilities of the major central banks, providing emergency funds for longer against broader collateral and to a wider range of counterparties. As far as the Bank of England is concerned, the ability of banks to pre-post collateral, including raw loans, means that they have more certainty about the credit that will available to them in the event of an emergency and at what price. That seems to me a great improvement on the pre-crisis arrangements with their 'constructive ambiguity'.

Central bank lending is invariably made against collateral and usually applies significant haircuts. Consequently, the associated risk to the exchequer is low. At times, however, the

implied risk to the public finances will be non-negligible, so it is appropriate that the fiscal authorities are not only alerted but in the lead if significant sums of public money are put at risk. So the protocol that requires the Governor to alert the Chancellor (as well as the Chair of the Treasury Committee) at the earliest possible opportunity seems to me entirely right and proper.

The more novel development since the financial crisis, however, is the increased reliance on macro-prudential policies that seek to head off financial stability risks pre-emptively. And a continuation of the unusually low natural safe rate of interest is likely to be conducive to further episodes of financial instability, as savers and investors are encouraged into riskier assets into order to generate higher returns. Moreover, such a 'search for yield' becomes particularly dangerous when combined with leverage. Property – both commercial and residential – represents a particularly vulnerable asset class, as we know that leveraged real-estate booms have often been the precursor of financial crises (see e.g. Jordà et al. 2016).

I do not want to say very much today about the kit in the macro-prudential tool box, other than to caution that we should be careful not to expect too much. We have relatively little experience in deploying such policies and they may turn out to have only limited traction, especially in periods of 'irrational exuberance' when financial institutions are likely to be strongly motivated to seek ways to circumvent them. For that reason, we should see macro-prudential policies as a complement to, rather than a substitute for, the post-crisis regulatory actions seeking to increase the robustness of the financial system.

A few words on the institutional framework for macro-prudential policy are, though, appropriate, as the case for delegation is weaker – or at least more complex – than for monetary policy. Returning to the three criteria I discussed earlier, there is certainly a good reason for delegating macro-prudential policy to an independent agent. There are high technical demands placed on decision makers. And during the boom phase of a financial cycle, risks tend to appear low and financial institutions and investors are prone to claiming that 'this time is different'; it takes a very determined government to take the punch bowl away just as the party is getting lively, especially if an election is in the offing. That much is similar to monetary policy.

The other criteria for effective and legitimate delegation are, though, more debatable. The objective of macro-prudential policy is to limit the build-up of systemic financial risks but – at present, at least – there is no accepted and continuously observed indicator of systemic risks analogous to the monetary policy objective of inflation. While the Financial Policy Committee (FPC), for instance, employs a dashboard of indicators to explain their decisions, there is often likely to be room for disagreement on whether action is necessary or not. This disagreement is likely to become more pronounced during the upswing of a financial cycle. Effective monitoring and accountability are more elusive. Finally, some macro-prudential actions – such as limiting the availability of high loan-to-income or loan-to-value mortgages – impinge on clearly identifiable sections of the electorate. Consequently they are likely to prove contentious unless there is clear public support for the delegation of such powers.

Balls et al. (2016) suggest that a solution to this lies in introducing an additional layer of political oversight in order to bolster political legitimacy, while retaining operational independence. The open question is whether at the same time that creates a back door through which the time-consistency problem that delegation is meant to solve can re-enter. In any case, I expect debate to continue not only on the technical aspects of macro-prudential policies but also on the most appropriate governance arrangements.

## Concluding remarks

Central banks, including the Bank of England, have come a long way in the past quarter of a century. During the NICE decade, it looked like we might have finally hit upon a successful and durable monetary framework. But the economic environment has looked considerably more challenging since the financial crisis and the ensuing Great Recession, necessitating innovative responses in both the monetary and financial policy spheres. Looking ahead, there are reasons to expect the natural rate of interest to recover somewhat, as the present bulge of middle-aged around the world passes through into retirement, and new technologies stimulate a renewed demand for funds to invest. But so long as the persistently low natural real rate of interest lasts, policy rates are likely to continue to be constrained from time to time. And that means unusual central bank policies, such as large-scale asset purchases, need to remain an option on the table.

Those unusual policies have also led central banks into territory that falls more naturally into the political domain. The line between monetary and fiscal policies has become more blurred. And persistently low interest rates and the asset-price effects of QE have focussed attention on the distributional consequences of monetary policy. Handling the resulting tensions so as to retain the benefits of delegation, while maintaining democratic legitimacy, represents a challenge. My guess is that the present monetary policy framework remains broadly fit for purpose and will prove up to that challenge. But the framework for macro-prudential policy is yet to be tested in anger.

## Notes

1. Woodford has suggested that the path under commitment could be approximated by instructing the central bank to pursue a target for the level of prices or nominal income rather than inflation, so that any shortfall during the emergency period has to be subsequently made up. But all this does is to relocate the time-inconsistency problem to the setting of the target, which can always be changed *ex post*. It therefore fails to provide a convincing solution.
2. Note that this is at variance with the popular perception that QE has penalised pensioners by lowering annuity rates. Extant pensioners are, of course, unaffected, while those about to retire are subject to an offsetting revaluation of their assets.
3. 'Circumstances may also arise in which attempts to keep inflation at the inflation target could exacerbate the development of imbalances that the FPC may judge to represent a potential risk to financial stability. The FPC's macroprudential tools are the first line of defence against such risks, but in these circumstances the MPC may wish to allow inflation to deviate from the target temporarily, consistent with its need to have regard to the policy actions of the FPC' (Hammond 2017).
4. A mild example of this arose in 2016 after the Bank of England announced that the expansion of the APF to include purchases of certain high-quality corporate debt as well as gilts. As it happened, the list of eligible companies included Apple, who had just been the subject of a damning tax judgement by the European Commission, exposing the Bank to criticism for supporting a company indulging in excessive tax avoidance.
5. 'While monetary policy – with super-low interest rates and quantitative easing – provided the necessary emergency medicine after the financial crash, we have to acknowledge there have been some bad side effects. People with assets have got richer. People without them have suffered. People with mortgages have found their debts cheaper. People with savings have found themselves poorer. A change has got to come' (May 2016).

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