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THE BRITISH RECOVERY IN INTERNATIONAL COMPARISON

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I am grateful to the Society of Business Economists for being included on the program of today's Annual Conference. This is my first straight-up speech focused on the outlook for the British economy as an external Monetary Policy Committee [MPC] member, and this is the right audience to which to give it. I hope that you will correct my errors, and add to the hopefulness of my outlook, but also not be too rough with me in doing so (MPC meetings are rough enough). The theme of this year's conference, "Sustaining the Recovery," is the right one for us to be considering, both as a matter of forecasting and of policymaking. What I would like to offer today is my own individual take on how the British recovery is progressing, and thus what I think is likely to happen next. My inclination is always to look at such questions in a comparative context, and, having had the excellent assistance of my advisers on the Bank's MPC unit, I will take you through a series of pointed rather than comprehensive comparisons of the UK economic outcomes with (primarily) those of France, Germany, Italy, and the United States. I hasten to add that these countries were not chosen for their similarly disappointing (all but one) World Cup performances, but for their comparability with the UK economy in size, development, and exposure to the global economic shocks of the last three years.

In summary, I would like to make four points about where we find ourselves today, and accordingly, about the nature of the challenge that I believe the MPC faces in deciding upon monetary policy in the months ahead. These are solely my own personal views.

- The impact of the negative shock that hit the UK economy was not hugely greater than or different from that which hit similar economies, nor has the recovery been noticeably different (except from the US). The only way the UK stands out on the macroeconomic data is that inflation has been rising here despite deflationary pressures.

- It is difficult to attribute the rise in inflation in the UK solely or even primarily to 'one-off' factors like VAT, past sterling depreciation, or energy prices. Instead, it seems to me that the

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[1] I am grateful to Kate Barker, Charlie Bean, Spencer Dale, Paul Fisher, Joe Gagnon, Ken Kuttner, Larry Meyer, David Miles, Jean Pisani-Ferry, Andrew Sentance, Paul Tucker, and Angel Ubide for discussions of these issues, and to Danny Eckloff, Tomas Hellebrandt, and Neil Meads for excellent research assistance. The views expressed here and any errors are solely my own, and not necessarily those of the MPC, of the Bank of England, or of PIIE.

transmission of those shocks to underlying inflation has increased a little. This is not a signal of a worrisome inflationary spiral, but the reality must be confronted.

- Sometimes the simplest explanation is the best. It appears that actual inflation outcomes, which have predominantly been overshoots of the Bank's target for the last four years, are contributing to a slow upwards creep in inflation trend. That this has occurred when Phillips curve or output gap models say prices should have gone sharply the other way, and prices have gone the other way elsewhere, to me indicates this is expectations driven.

- In my opinion, this creep is the unsurprising result of having set monetary policy to prevent a terrible downside risk, and finding policy appears too loose if that risk thankfully does not come to pass. With the strong recovery outside of Western Europe proceeding on one side, and the coming austerity at home and in the Euro Area on the other, I think the UK is still poised between two very different outcomes. If we get to the positive outcome, I will be only too happy to raise rates and, should others on the MPC agree to do so, I am confident that would end inflation creep very quickly.

The comparative normality of the UK recession and recovery –

These are not normal times in economic terms, and the global financial crisis of 2007-2009 was not a normal negative shock. Looking across similar advanced economies, however, we can see that the UK experience so far is broadly comparable to that of other countries. Figure 1 showing the co-movement of major equity markets reminds us that this was a common shock, in timing and in scale – that correlation was what was most striking about the fall 2008 events, in many ways. The facts that the UK had been an exporter of financial services, had something of a housing bubble, and had been running current account and public deficits still left us in the middle of the pack. The damage to the UK economy in terms of output and employment declines was severe in human terms but not extreme compared to others – Figure 2 plots the percentage change declines from pre-crisis peak in employment and GDP for a range of countries, and the UK distance from origin is higher than that of France or Germany, but lower than that of the US. The worst damaged to date were of course Ireland and Spain.

Looking more closely at the movements of GDP and its components since the crisis, the UK continues to look mostly middle-of-the-pack (that is not much to brag about, but analytically is worth noting). Our recession and recovery to date is essentially indistinguishable from those of Germany and Italy (Figure 3), our household consumption has declined a little more than others' but since 2000 overall performance was similar to that of France and the US (Figure 4), and our corporate

private investment has only been slightly worse than most (Figure 5)[2]. When one adds in residential construction to assess gross fixed capital formation (Figure 6), the UK definitely has had a worse boom bust than our comparators, but it has not affected the other GDP components which we care about more all that much. In terms of corporate liquidations, as a measure of corporate distress (or perhaps creative destruction), the UK appears to be coming in between the US and continental Europe (Figure 7), which is where one would expect to be. The UK again is between the US and continental Europe in terms of labor hoarding versus labor shedding (Figure 8) in response to contraction. This distance between the US and UK might seem a bit surprising to some, but the US has been an extreme outlier on this score for some time (though admittedly we have noticed more labor hoarding in the UK than in some past episodes). Consistent with that pattern, the US is an outlier in terms of having soaring output per hour (Figure 9), while the UK has had a contraction and modest recovery like its European neighbors.

What this breezing through some simple charts I hope conveys is that we all suffered a similar scale negative shock. In fact, given the rise in unemployment, decline in output and its components, and critically the similarity across countries and asset classes with differing sectoral compositions and exposures, I hope we recognize that this was a negative demand shock. Of course, one has to look at price movements as well to try to establish that. So let us look at where we are on inflation. A current snapshot (Figures 10 and 11) shows that headline and core CPI inflation are below their averages and implicit inflation targets in all the UK's comparators, but not the UK. In fact, the UK at last data has a full percentage point higher inflation on both these measures than the next highest inflation economy considered. Looking at the perhaps more telling change in core CPI inflation since January 2008 in Figure 12, we see that inflation has declined in all the comparator countries but risen more than a percent in the UK figure.

Does this mean that the UK suffered a largely supply shock when all the other comparable economies (including all other relevant OECD economies beyond those shown here) suffered something closer to a pure demand shock? Had there been a clear split in inflation behavior between those countries specialized in financial services versus those not, or between those who had housing boom-bust cycles versus those which did not, one might be able to start making such a case – but when one

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[2] Correction: the original version published incorrectly stated that corporate private investment had held up better than most, after climbing by less.

considers the US, Spain, and Ireland, and their declining inflation to go with their contraction, that seems a stretch. As I have argued elsewhere (Posen 2010a), it is prima facie less than credible that all of the UK workforce woke up one morning in October 2008 with their left arms missing, or that non-financial UK businesses found their technological knowledge gone overnight either. Even if one allows for a substantial decline in UK aggregate supply in the immediate crisis aftermath, on the order of the 6% of GDP that the new Office for Budget Responsibility has reportedly estimated, that would still leave the UK with a substantial output gap.[3] I will put a little more econometric meat on this point later, but the main takeaway is that we have to explain why UK inflation has risen and is still rising despite a significant output (and employment) gap that should put pressure downwards on inflation – and one that is apparently having a disinflationary if not deflationary effect in comparable countries.

Is the UK inflation rise just the result of one-off factors?[4] –

There certainly have been a number of relative price shocks hitting the UK economy during the crisis. Oil and industrial commodity prices have risen intermittently in response to demand from emerging economies, particularly China – but that has been a global effect, and core inflation is supposed to strip out that first-round effect. The UK Value Added Tax was lowered for 2009 and raised back for 2010, but that base effect should be easily visible and limited in both magnitude and duration. Yet, as shown in Figure 13, core inflation in the UK has been rising at an increasing rate since late 2008. Even attributing the full jump in core CPI at end 2009 to the VAT reinstatement - which seems excessive since that would imply full pass-through of the VAT increase to CPI – that pattern is in contrast to the declining trend rate of inflation in the other economies (US, France, Germany, Italy) included in the figure.

Displaying the divergence more starkly, I plot the current core inflation rate versus the percentage decline in output relative to 2000-2007 growth trend for a range of crisis hit economies in Figure 14; the dotted lines represent the average outturns over the included sample. The UK is the only country

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[3] I personally believe that aggregate supply and trend growth do erode as a result of financial crises, but that it takes time. Workers have to be long-term unemployed and lose human capital, firms have to forego useful investments due to credit constraints or other factors, and so on, before the loss is felt.

[4] My MPC colleagues, Paul Fisher (2010) and Andrew Sentance (2010a and b), give their own decompositions of why UK CPI inflation is currently so high. The diversity of views made public recently should be a clear signal to observers of how seriously we are discussing this issue within the committee.

besides Greece to have both above average core inflation and larger than average output decline. There has not been a surge in UK wages, though, as shown in Figure 15. The UK has had something of a decline in competitiveness, by having its unit labor costs rise consistently in recent years, including during the crisis (Figures 16 and 17). Here again, though, the international comparison provides a useful check: Italy and France had comparable rises in unit labor costs but have not seen the increase in inflation seen in the UK, and were Spain or Ireland or Greece crowded into this chart, their unit labor costs would have risen even more.

Of course, I have so far ignored the perhaps most obvious candidate for a one-time relative price shock that would lead to higher UK inflation temporarily – the nearly 25% trade weighted decline in the sterling exchange rate index over the course of 2008 and early 2009. As shown in Figure 18, there was a substantial decline in sterling against the dollar and a lesser decline against the euro from third quarter 2008 through first quarter 2009 (unseen in this picture is the relative stability of the £ERI through most of the preceding decade, though there were large swings against the dollar and euro which offset each other). If one allows for some usual lags to transmit the exchange rate change to the domestic inflation rate, the impact should have been felt on UK CPI starting in late 2009. So maybe there is no mystery to solve here.

I believe that the question of why inflation stayed up and even increased in the UK over the last two years remains, even when the exchange rate is taken into account. A variety of studies suggest that exchange rate pass-through to inflation has been declining over the last 20 years.[5] Greater anchoring of inflation expectations and increased price flexibility and competition, as well as greater opportunities to hedge exchange rate exposure and the creation of production sites for many products near markets, all were factors expected to lead to pricing behavior which tended to diminish the impact of exchange rate movements – and that is what was found. Gagnon (2006) looked directly at the UK experience in the 1990s, and found that "…the United Kingdom experienced large and sudden exchange rate movements that had no apparent impact on overall consumer prices." That is a conclusion that should surprise no one in this audience, remembering the initial triumph of the Bank of England's inflation targeting regime being the exit from the ERM in 1992 without much in the way of imported inflation.

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[5] See Gagnon (2010) and the references therein, especially Ihrig, et al (2006) and Marazzi and Sheets (2007).

Yes, some exchange rate pass-through to inflation remains in all countries, but the degree of pass-through seen in the UK over the last two years is out of step with its recent history, with other countries' current experience, and with the factors encouraging diminished pass-through which should apply to the UK at least as much as anywhere. Labeling the source of the UK inflation rise as exchange rate pass-through simply shifts the problem to why the impact of pass-through was suddenly so large, able to offset strong downward pressure on prices felt everywhere else?

Sometimes the simplest explanation is best –

When I applied for the job of External Member of the Bank's MPC, I was asked what framework or model I had in mind for inflation determination. I found out later that a good answer would have been a framework where in the short-run a (New Keynesian) Phillips curve was at work, with occasional relative price shocks that affected prices temporarily, but in the long-run it was the monetary regime's anchoring of inflation expectations that mattered. This is a pretty good summary of the state of mainstream practical thinking about inflation forecasting, and it underlies most central bank models as well as being sensible. So if I return to that framework when thinking about the current inflation outcomes in the UK, where am I? The Phillips curve would point to extreme downward pressure on prices; relative price shifts either are insufficient to explain the apparent more than offsetting of that pressure, or we require an explanation for why their persistence and impact have apparently increased. I am forced to consider changes in the anchoring of inflation expectations as the source of the upward creep we have seen in UK inflation of late.

Some in the market commentariat would ask what took me so long to get to this point. The extension of Quantitative Easing [QE] on a large scale is for them sufficient explanation of rising inflation expectations, full stop. As I discussed in Posen (2009), however, the issue with QE is the relative undependability of its linkages from securities purchases to broad money growth, and from broad money growth to prices and real income. Figure 19 gives the comparable broad money growth rates for the UK and comparator countries, and it is evident (and to some degree frustrating) that we are not seeing sustained growth in broad money, despite the Bank's QE through February 2010. It also is frankly contrary to the spirit of any sort of consistent monetarist world view that a central bank would suddenly buy 10% of GDP in government bonds in a year and inflation would be a couple of percentage points higher than otherwise expected. I think it more sensible to believe that the

juxtaposition of intentionally visibly aggressive QE with fiscal stimulus and one-time inflationary price shocks contributed to the kind of modest but real upwards creep in inflation and inflation expectations we have seen.

It matters how inflation expectations are formed. In the simple versions of the time-inconsistency models that motivate much of modern monetary economics (including the theory behind inflation targeting), private sector actors are inherently suspicious of the central bank, which has an incentive to spring inflationary surprises – if the central bank reveals itself to be 'soft' on inflation, inflation expectations jump up immediately. More realistically (and more empirically supported), a major part of the intuition for inflation targeting was that by providing a credible nominal anchor, inflation targeting central banks would be better able to respond flexibly to shocks. Private actors would believe that a deviation from strict price stabilizing policies, say to stabilize a negative demand shock or to allow a first round of a supply shock to pass through, would be only temporary.[6]

Yet, presumably private sector actors form their expectations about the central bank's commitment to that nominal anchor based on observation, and update them as life proceeds. And presumably that updating is a matter of degree, of estimating and discounting the willingness of the central bank to rapidly disinflate in response to shocks, rather than an all or nothing act of faith. A private actor viewing the inflation outcomes in the United Kingdom over the last few years would be struck by the number of times inflation came in over target. As seen in Figure 20, since January 2005, UK headline CPI inflation has been below target 17 times out of 65 months. The shorter the private actor's perspective, the more consistently off target the Bank seems to have been – inflation has been above target 23 of the last 29 months since January 2008, and increasingly so on average. The MPC's inflation forecasts in the Inflation Reports have seemed unduly sanguine ex post as well: for example, in May 2008, before the crisis turned severe, the forecast for inflation in 2010Q1 was 2.25%; in May 2009, the point forecast for 2010Q1 was down to 0.79%; actual inflation for 2010Q1 as measured was 3.0%.

It is naïve or disingenuous for us on the MPC to pretend that such a sustained series of above target outcomes and forecast errors would have no impact at the margin for some people, even if we believe

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[6] See Bernanke, et al (1999), King (1997), and Kuttner and Posen (1999) for discussions of and evidence on this idea of inflation target reducing 'stabilization bias.'

- as I do strongly - that largely the right decisions and forecasts were made ex ante. Yes, if we were completely 100% persuasive to the public that our decisions were ex ante right, that all one-time relative price shifts were just those, that only unforeseeable factors led to our forecast misses, that our model of the economy is not subject to obvious error, and that changes in the MPC's membership over time have no impact on the intent or ability of the MPC to set policy, then private actors would follow our instructions to see through all of the intervening outcomes. It seems to me that it is more reasonable to assume that some decision makers in the economy take recent outcomes into account when forming their inflation expectations. Even if it were simply bad luck that a bunch of random price shocks hit the UK economy with unexpected frequency for a period, and over that period the shocks randomly all came up inflationary rather than evenly positive and negative, I would assume that to have some effect on some people's inflation expectations.

A more sophisticated observer, if anything, might share some of the concerns I voiced earlier that inflation would have been assumed to come down as a result of the crisis (as the MPC did in 2009), which would prompt further scrutiny of the past record. Figures 21-25 shows simple Phillips curves estimated up to January 2008 for the UK and our four comparator economies, following the method of Liu and Rudebusch (2010).[7] Then an out of sample forecast is made for core inflation based on the actual data inputs from then forward and the estimated coefficients. In the US case (Figure 21), actual core inflation remains a small amount above the out of sample forecast throughout the last two years, but trends downward clearly in near parallel with the forecast; in the French, German, and Italian cases (Figures 22-24), core inflation stays pretty uniformly below the forecast, and fluctuates there. Only in the UK case (Figure 25) does core inflation not only stay uniformly above the forecast but turn strongly upwards when the forecast turns downward. This gives some empirical weight to the intuition one might have about how odd the UK's inflation performance has been, given the output gap.[8]

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[7] That is these are simple accelerationist Phillips curves, based on regression of the first difference of core inflation on a constant, lagged first differences of core inflation, lagged core inflation, and an unemployment gap (that gap calculated as the difference between actual unemployment and the OECD's estimate of the NAIRU).

[8] Bean (2006) gave some compelling arguments for why Phillips curves would become flatter – output changes would have less effect on inflation – under globalization. That does not explain why the UK would have an exceptionally flat (or if simply plotted, even upward sloping) Phillips curve during the crisis in contrast to other open economies. If anything, the US should be the outlier, being the least open of the five economies looked at here. This is why I find it disturbing rather than comforting that output gaps in other economies are already pushing down on inflation there (as discussed in the June 2010 MPC minutes).

A small slow upwards creep in inflation expectations is not worth panicking over, and certainly is not a reason to tighten policy when the forecast argues against so doing. And that kind of creep is indeed what I believe that we are seeing. Figure 26 shows two surveys of household inflation expectations which the Bank monitors, and they both show a slight upward drift over the last year (compare to their average values; do not take the levels at face value); Figure 27 presents two similar series of inflation expectations from professional forecasters that have shown some upward drift despite the downward pressure of the output gap. As another reasonability check for this interpretation, we estimated a pair of adaptive expectation models for inflation.[9] For this exercise, we assumed that expectations for inflation in January 2005 (formed in January 2004) equaled the inflation target, i.e., 2% on headline CPI. As shown in Figure 28, with a small weight on past inflation misses, inflation expectations would have risen to 2.63% by last month; with a higher but still limited weight on the past outturn, inflation expectations would have risen to 2.95. Ockham's razor would seem to apply here – modest unanchoring of inflation expectations is the simplest and soundest explanation for recent UK inflation outcomes.

[9] These models assume inflation expectations evolve according to an adaptive process where today's inflation expectation equals the preceding year's expectation plus a discount on the difference between actual inflation this year and the expectation of this year's inflation last period. Ball and Moffitt (2001) make a sophisticated case for the relevance of adaptive inflation expectations models to a meaningful portion of households.

Still caught between two states of the world –

So the UK recovery is comparable to that of other major economies, given the negative demand shock we all have suffered, and only stands out for its accompaniment by mildly rising inflation. I believe that mildly rising UK inflation in the face of downwards pressure from a significant output gap, unseen elsewhere, cannot be attributed solely to a series of one-off factors – it requires some explanation of why transmission of those relative price shifts (including from sterling depreciation) was larger than in the recent past. I argue that the most logical and empirically reasonable explanation for inflation creep is some unanchoring of inflation expectations, caused by the series of above target outcomes for UK inflation in recent years. Yet, if this creep is not a remotely likely source of a rapid inflation spiral, and if there is reason to think that inflation will come back down in due course, why does the assessment that I offer matter?

The first reason why it matters is simply a matter of improving forecast accuracy – if the dynamic that I suggest here is at work, a series of above target inflation outcomes would push up future inflation outcomes more than would occur absent this effect (and that would likely apply with some discount even for VAT induced base effects). The second reason is that I believe that we should be open with the public about what we think is driving current and future economic outcomes, especially if we think our own past performance is part of the cause of those outcomes. The third reason is that the British public is entitled to and, as importantly, feels entitled to an explanation of why their purchasing power has steadily declined in recent years. If we dismiss all relative price shifts against wage earners as one-time effects that the MPC encourages the public to ignore, and that the committee itself certainly will look past, then there will be understandable questioning of what is the greater purpose of the inflation target that allows such inflation to occur.

The primary reason, however, that I have advanced this argument about why inflation has risen in the UK in the face of an output gap is the guidance it should give us for future policy. Speaking for myself, I see the inflation target overshoots that occurred over the last two and a half years as the comprehensible result of a monetary policy stance set to be very stimulating to prevent a terrible downside risk of deflation and depression. When that downside risk thankfully did not come to pass, in large part because of the monetary policy measures undertaken by the Bank of England, the result was inflation above target – moreover, the impression given to the public that monetary policy was

standing by when inflation was recurrently above target, and while the government was issuing a lot of debt, reinforced the impact of the overshoots on expectation. As I have argued today, one side effect of this stance was of a mild upward creep in inflation expectations, even though the policy setting was the right one ex ante.

My interpretation here rests on the view that the UK economy is potentially switching between two states – a recovery, which we are now in, albeit perhaps an initially weak one for the many widely discussed reasons; and the renewal of a severe recession if not outright deflation. Though one can (and I did) plot smooth time-series of data outcomes that give the appearance of gradual even cyclical shifts, to my mind, the underlying process and risks for the UK economy are of a jump between these states (at least since the crisis began).[10] As a result, monetary policy set to be loose enough to prevent falling into recession situation will be too loose if it is successful in preventing that outcome – and will continue to feed a slow rise in inflation expectations. I believe that this situation is still the one which the UK economy faces, and thus the MPC must confront as well.

On the positive side is the natural tendency for market economies to recover, even from severe shocks, absent major policy mistakes (as I argued in Posen (2010a) and elsewhere). That should apply to the UK, and indeed already seems to be the case. The real side indicators in the UK have been increasingly promising, as have most of the surveys of consumer and business confidence, as one would expect in a recovery. Given the sustained strong demand growth in emerging markets, especially in China, and the healthy recoveries in the US and to a lesser degree Japan, such a recovery in the UK also benefits from a favorable external boost.[11] The impact of past monetary ease and financial stabilization provide a further basis for growth.

Yet, we are about to enter a period of fiscal austerity at home and in the Euro Area, our most important trading partner. We should make no mistake – this will hurt. What was stimulative on the

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[10] Econometric sophisticates will recognize this is a loose description of the Markov-switching model of business cycles developed by Hamilton (1989). Chauvet and Hamilton (2005) gives an updated look at this approach, and Chauvet and Yu (2006) applies this method to business cycle dating in the G7, including the UK.

[11] Sentance (2010a) makes a strong and optimistic case for the importance of growth abroad to UK economic prospects. I was on record before joining the MPC in September 2009 as forecasting strong recoveries in the US and Japan from the crisis, so I am sympathetic to the idea that such growth is for real.

way up will be contractionary on the way down.[12] To the degree that UK fiscal policy had a low multiplier due to openness and other factors, of course, that will also diminish the contractionary impact.[13] But, as I put it in Posen (2010a), this is about pre-empting a potential interest rate rise, not getting a direct benefit from austerity now. The initiative of the Spanish government has led to a constructive cascade of commitments to stress testing of European banks, putting hope of a floor under financial spillovers there. I still believe, however, that the negative impact of combined austerity of all Euro Area members will be greater than the sum of its parts in terms of adding up direct demand and trade effects.

I have laid awake a number of nights recently trying to figure out how big is the risk that the major economies are repeating the mistake of the US in 1937 (or in milder form Japan in 1997) by tightening fiscal policy too much, too rapidly. For the UK specifically, unlike the US or Japan then (or even now), there may simply be no choice – the structural budget deficit is now too large, the state share of the economy has become too high, and the risk of savings leaving our markets remains very small but still too great. For the world in general, and for the surplus low-debt economies in Asia and Europe in particular, the case for rapid austerity and for their imposing austerity on others is far from as clear. I am hopeful and halfway convinced that even if there will be excessive and excessively synchronized austerity, the world at large will not fall back into deep recession - unlike in the 1930s, the size and vitality of non-Western markets today, and the relatively greater stability of our financial systems post-interventions, should limit the transmission of fiscal contraction.

In my opinion, that leaves the UK economy tentatively in the recovery state, but still subject to switching back into the recession state. If you look at Chart 5.13 of our May *Inflation Report* (Bank of England (2010), page 47, reproduced here as Figure 29), you will see a picture consistent with the story that I am telling. This chart shows a U-shaped distribution of forecast inflation outcomes two and three years ahead. For me, this is more informative at present than the inflation fan chart. The U-shaped distribution means that the MPC's current forecast is that we are far more likely to have an economy with less than 1.5% inflation or with greater than 2.5% inflation in over our target horizon than an outcome close to our target; the likelihood of ending up in the low inflation outcome (what I

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[12] For general discussions of the efficacy of fiscal policy, see Auerbach and Gale (2009) and Fatas and Mihov (2009), and the references therein.
[13] Padoan (2009) includes estimates of the multiplier on various countries' stimulus plans in response to the crisis, including that of the UK.

would term the bad state) diminishes between 2012Q2 and 2013Q2, but does not disappear. Please note that I am not ascribing my specific two state view of the British economic outlook, let alone my own interpretation of why this is the case and how it results in inflation creep, to any other members of the MPC beyond myself. What I am pointing out is that my analysis and view of the outlook is one consistent way of understanding both the current UK economic situation and the MPC's present forecast as published last month.

If we are fortunate, our present monetary policy stance combined with the UK economy's natural tendency to recover and with sustained global growth outside of Europe will be sufficient to get the UK to the good outcome. That would result in more inflation overshooting in the interim, given our policy stance, and in that state of affairs I would be only too happy to vote for an interest rate increase. If a majority of the MPC agrees at that time to tighten policy, I am fully confident that any inflation creep would be reversed, and that British inflation expectations would be totally re-anchored. I regret to say that I am not as confident, however, that we will get to that favorable situation, and that much of what determines our outlook will take place beyond our borders and certainly beyond the MPC's remit.

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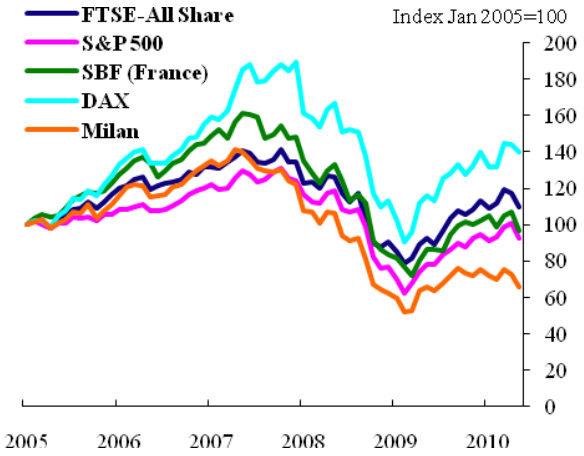
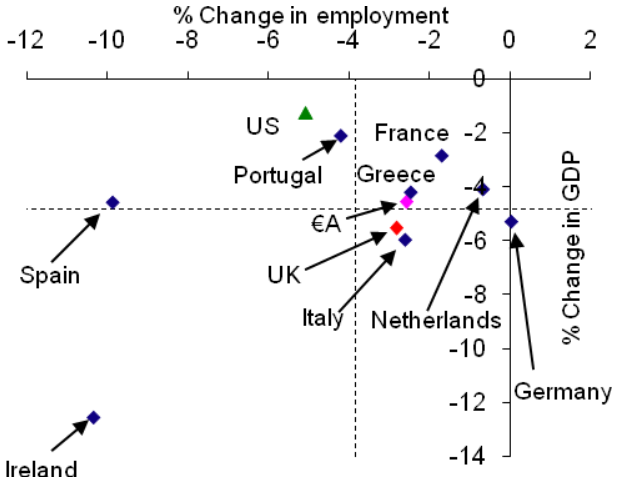
Sentance, A (2010b), 'We must force the inflation genie back into its bottle', *The Sunday Times*, 13 June, available at http://www.thesundaytimes.co.uk/sto/business/Economy/article315914.ece

Figure 1: International equity co-movements



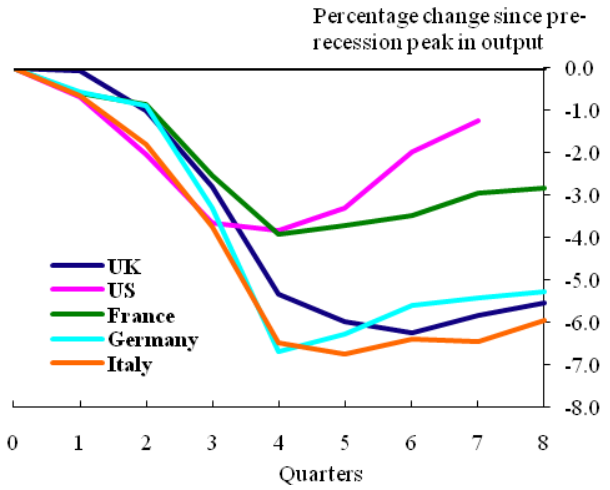
Source: Thompson DataStream

Figure 2: Output and employment declines since peaks



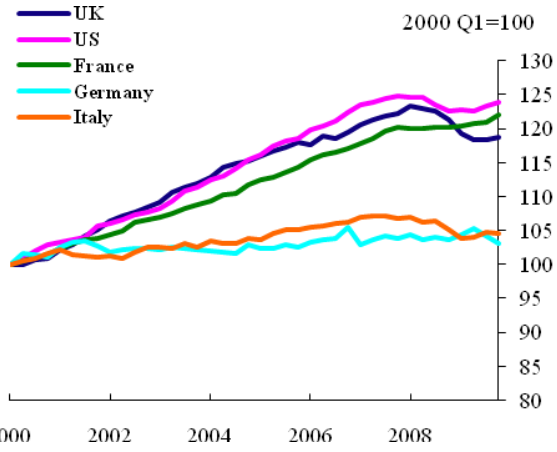
Source: Thompson DataStream
Note: Dotted line represent average outturns over selected countries.

Figure 3: GDP movements



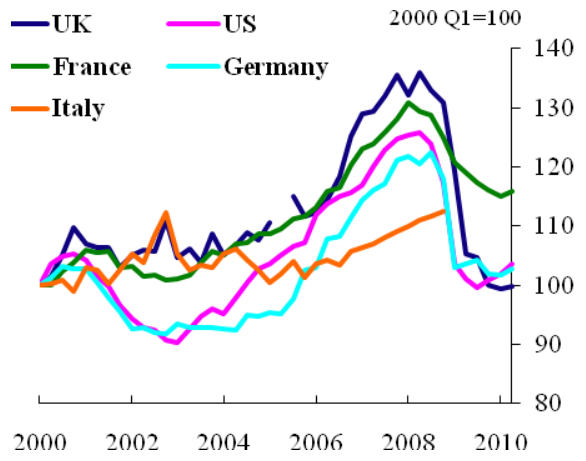
Source: Thompson DataStream and National Sources

Figure 4: Household consumption



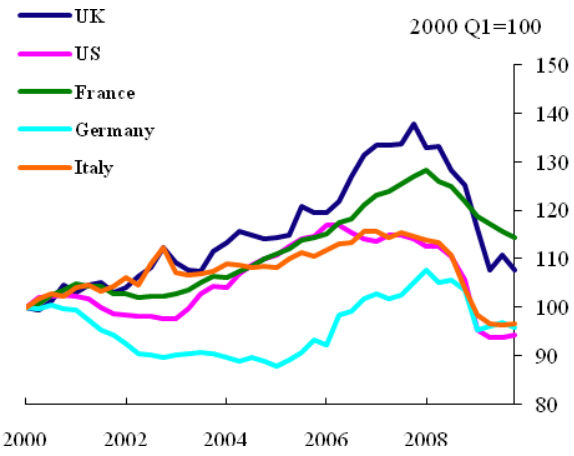
Source: Bank Calculations and OECD

Figure 5: Private investment



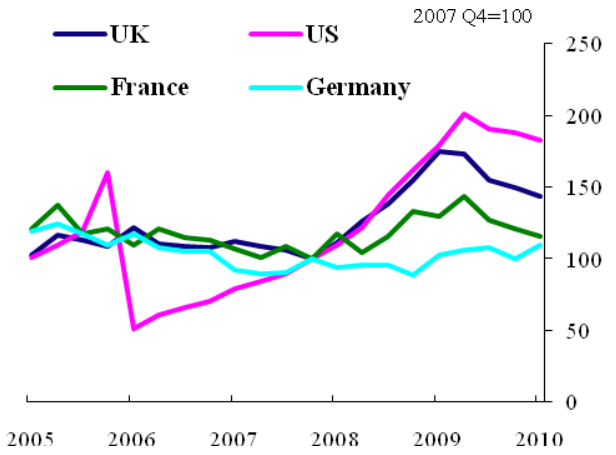
Source: Bank Calculations and OECD
Note: This chart is corrected from the version originally published (see also footnote 2)

Figure 6: Gross fixed capital formation



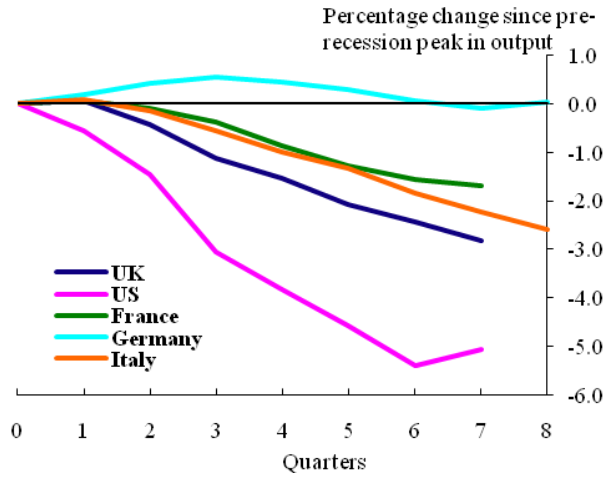
Source: Bank Calculations and OECD
Note: GFCF = Private Investment + House Building.

Figure 7: Corporate liquidations



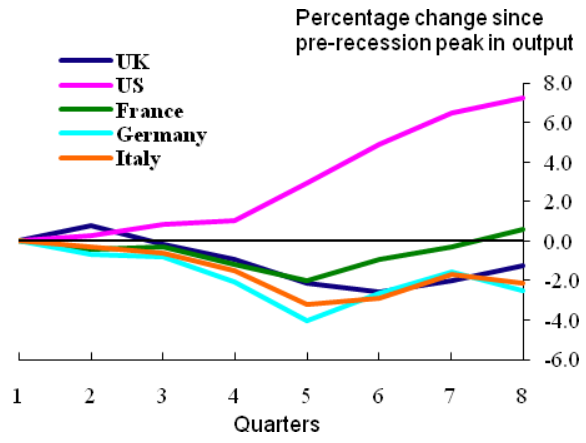
Source: National sources and Thompson DataStream

Figure 8: Employment movements



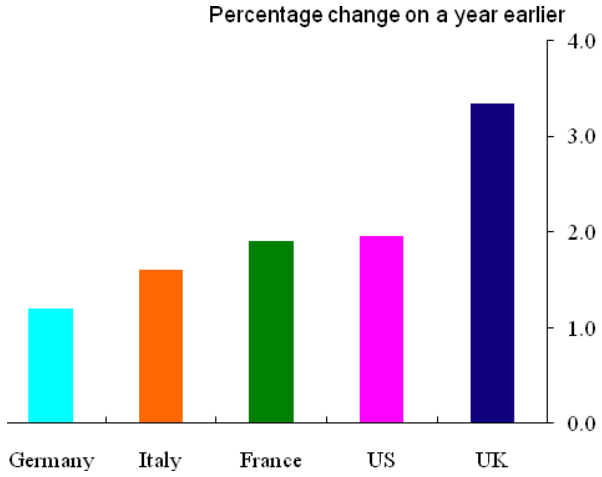
Source: Thompson DataStream and National Sources

Figure 9: Output per hour



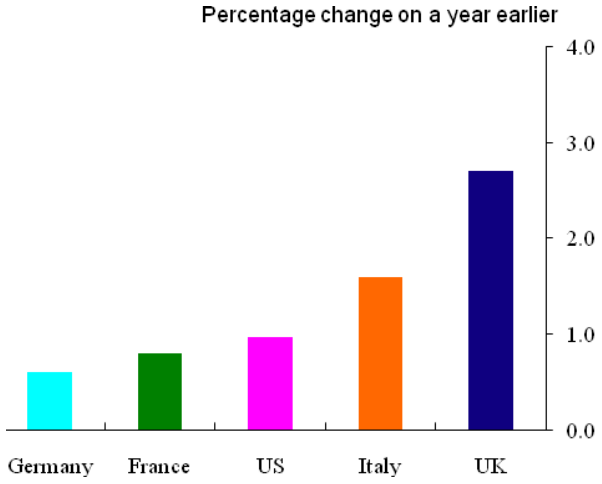
Source: Thompson Datastream
Note: US Output per hour is of the non-farm business sector, all other data are whole economy measures.

Figure 10: Headline CPI inflation



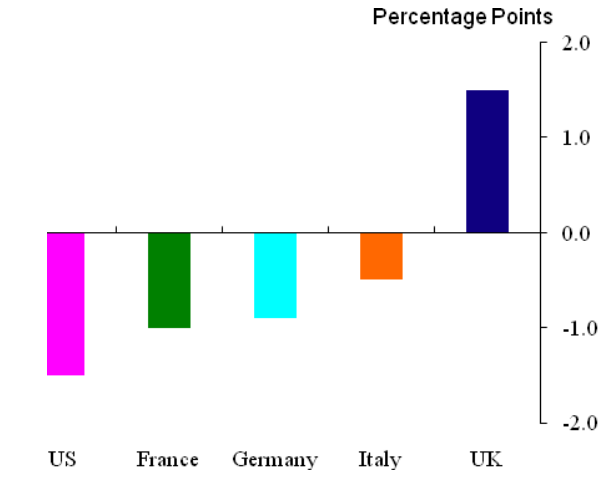
Source: National Sources

Figure 11: Core CPI inflation



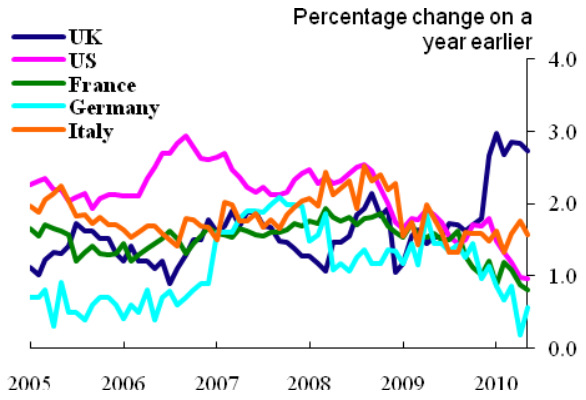
Source: National Sources

Figure 12: Change in 'Core' CPI inflation since Jan 2008



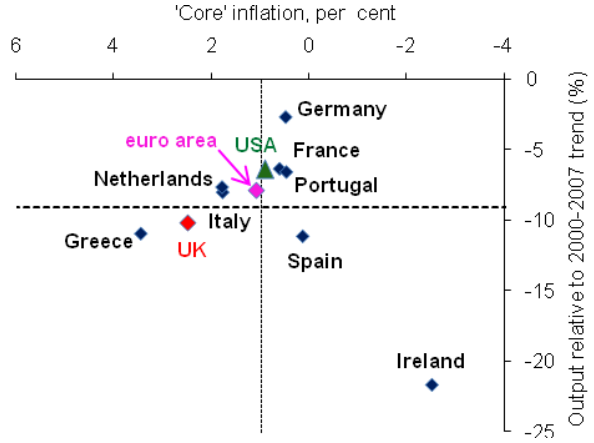
Source: National Sources

Figure 13: Core inflation trends



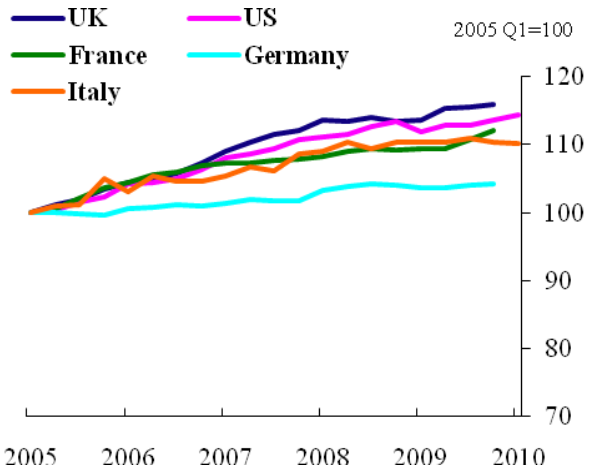
Source: Thompson Datastream

Figure 14: Change in output vs. trend and 'core' inflation



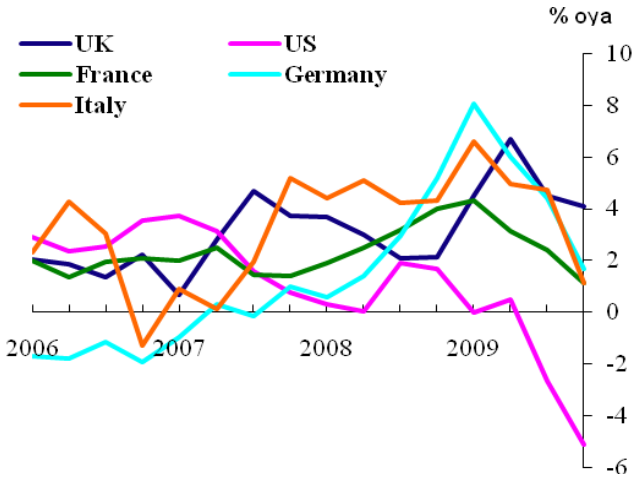
Source: OECD and Thompson Datastream
Note: Dotted lines represent average outturns over selected countries

Figure 15: Nominal compensation per employee



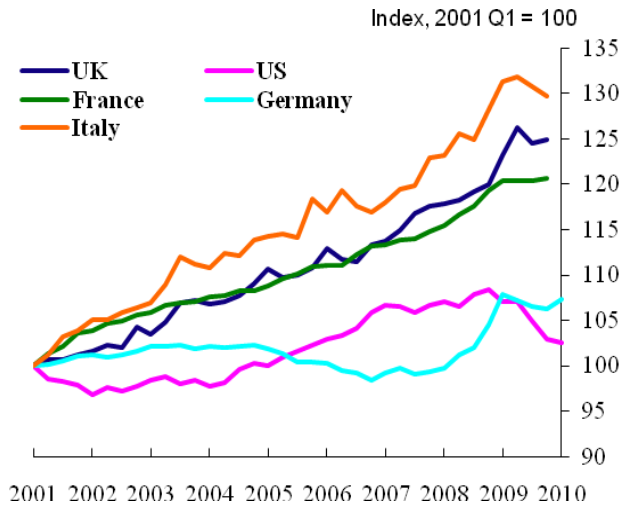
Source: Thompson Datastream and EuroStat

Figure 16: Unit labour cost trends



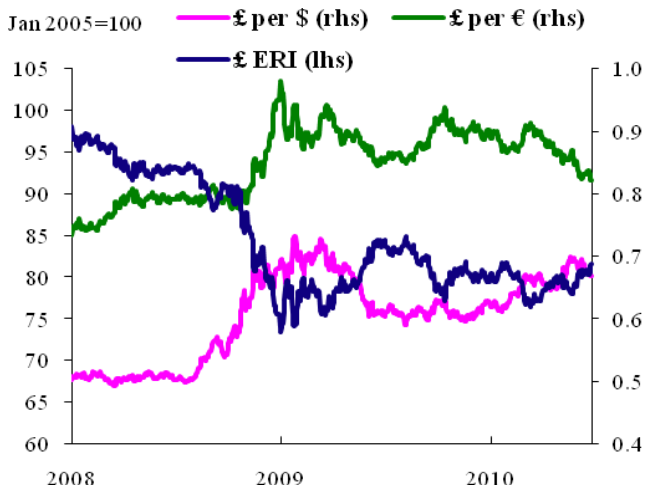
Source: OECD and Thompson DataStream

Figure 17: Unit labour costs: levels



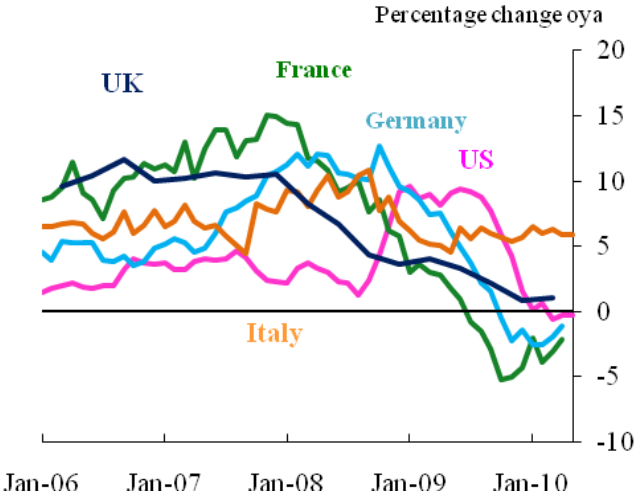
Source: OECD and Thompson DataStream

Figure 18: Sterling exchange rate bi-laterals and ERI



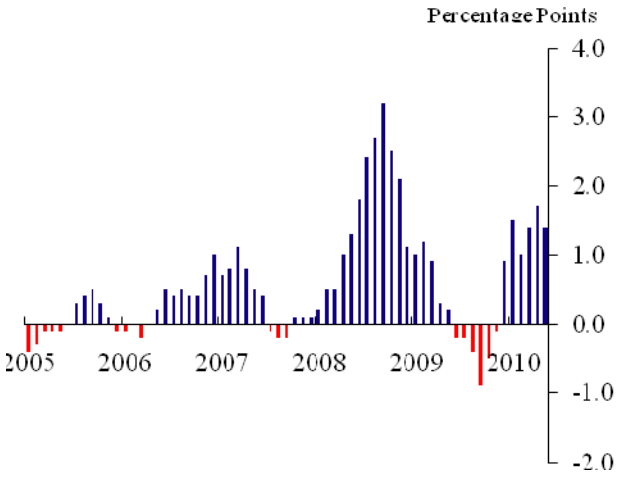
Source: Thompson DataStream

Figure 19: Broad Money Growth Rates



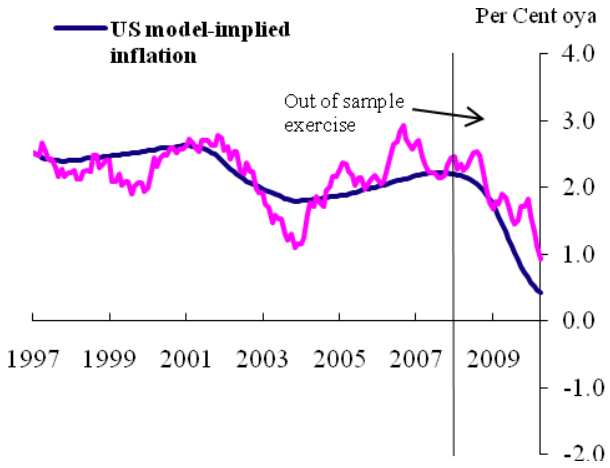
Source: Thompson DataStream and Bank of England
Note: UK broad money growth is excluding intermediate OFCs

Figure 20: UK headline CPI outturns versus target



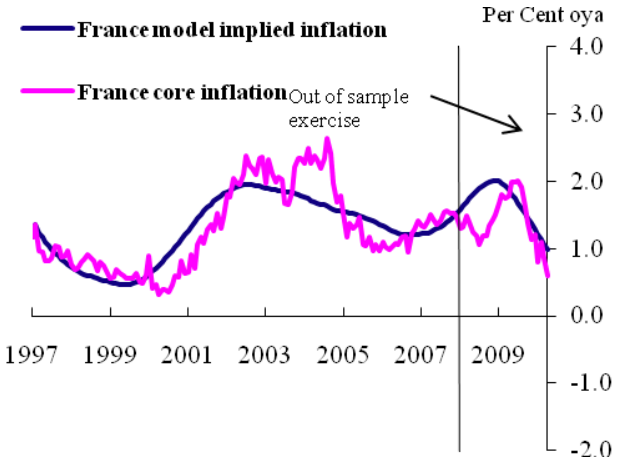
Source: ONS and Bank calculations

Figure 21: Phillips curve model of US core inflation



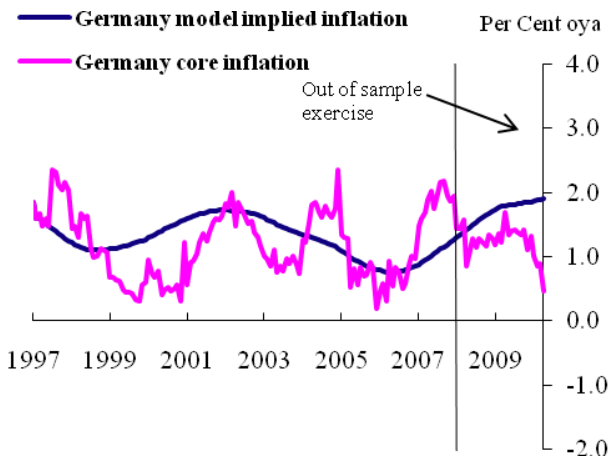
Source: Bank calculations, OECD and Thompson Datastream
Based on regression of the first difference of core inflation on lagged difference, a constant, lagged core inflation and an unemployment gap.

Figure 22: Phillips curve of French core inflation



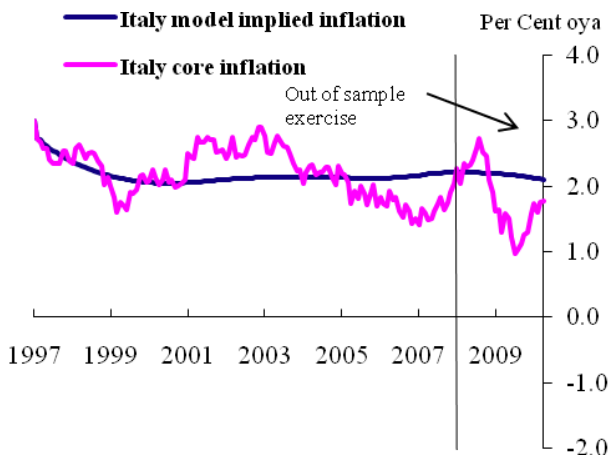
Source: Bank calculations, OECD and Thompson DataStream
Based on regression of the first difference of core inflation on lagged difference, a constant, lagged core inflation and an unemployment gap.

Figure 23: Phillips curve model of German core inflation



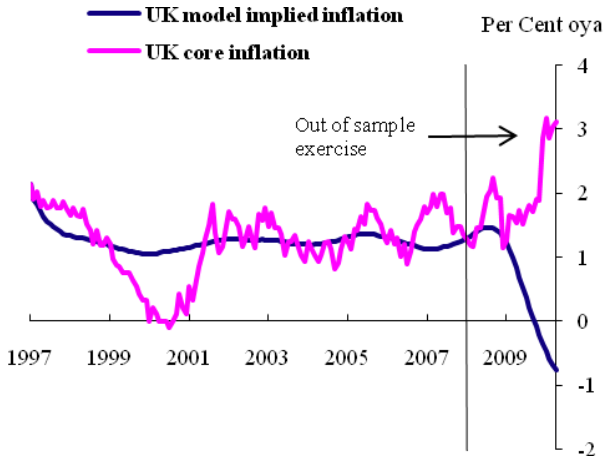
Source: Bank calculations, OECD and Thompson Datastream
Based on regression of the first difference of core inflation on lagged difference, a constant, lagged core inflation and an unemployment gap.

Figure 24: Phillips curve model of Italian core inflation



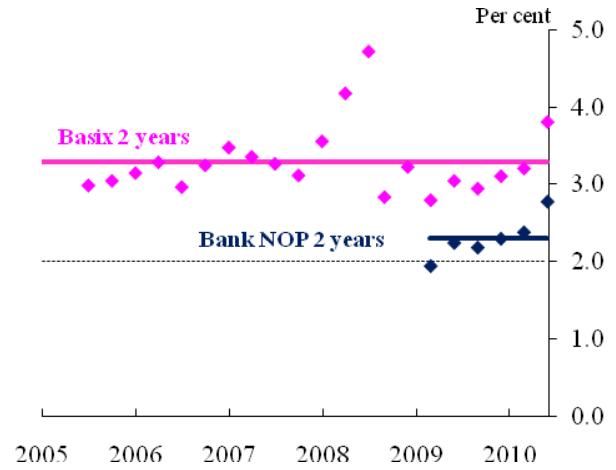
Source: Bank calculations, OECD and Thompson DataStream
Based on regression of the first difference of core inflation on lagged difference, a constant, lagged core inflation and an unemployment gap.

Figure 25: Phillips curve model of UK core inflation



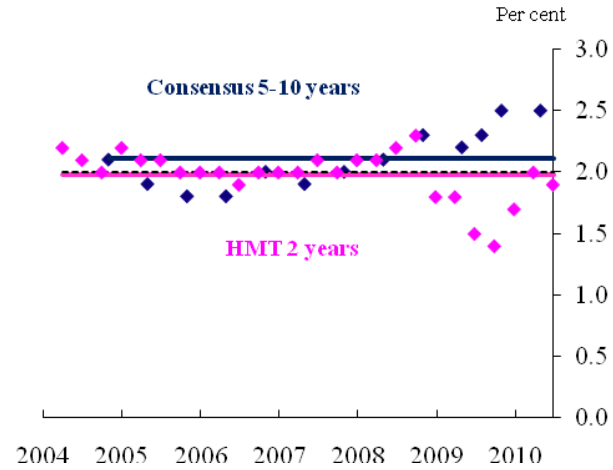
Source: Bank calculations, OECD and Thompson DataStream
Based on regression of the first difference of core inflation on lagged difference, a constant, lagged core inflation and an unemployment gap.

Figure 26: UK Households' inflation expectations



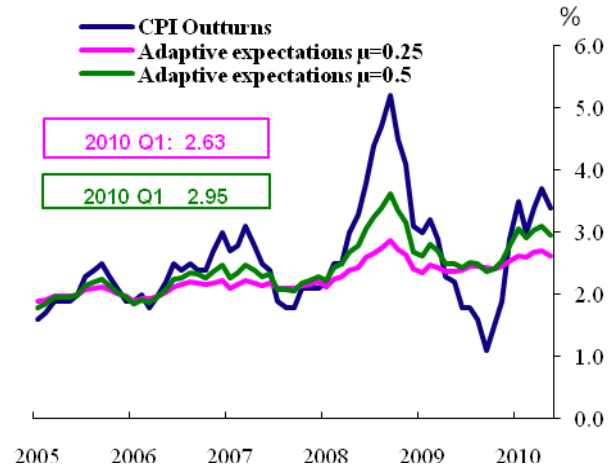
Source: Barclays Capital and Bank of England
Note: Horizontal lines represent series averages.

Figure 27: UK Professional forecasters inflation expectations



Source: Consensus Economics and HM Treasury
Note: Horizontal lines represent series averages.

Figure 28: Adaptive expectations model of UK inflation

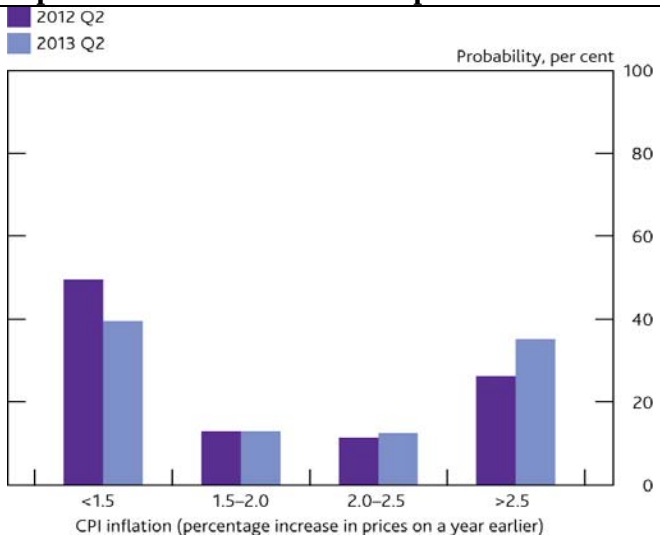


Source: Bank calculations

Note: Assuming that inflation expectations follow a simple adaptive process and that expectations for inflation in January 2005 (formed in January 2004) equalled 2%:

$$\pi_t^e = \pi_{t-1}^e + \mu(\pi_t - \pi_{t-1}^e)$$

Figure 29: Frequency distribution of CPI inflation, based on market interest rate expectations and £200bn asset purchases



Source: Bank of England, May 2010 Inflation Report